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Abstract

This report discusses: 1) the work conducted in the museum groups and an evaluation of the participatory practice in three countries, over the course of two years; 2) guidelines and recommendations for future research and the development of inclusive museum cultures. The participatory practice is measured against six validities.

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Recommendations, Guidelines & Policy Briefing

1 GLOSSARY

Cultural Institutions – Institutions whose primary purpose is to preserve, promote or teach about cultural objects, environments, periods or practices. Cultural institutions can include museums, national parks, monuments or art centres.

Epistemological Model – The way a topic or subject is understood by studying the development of knowledge about the topic. For example, an epistemological model of disability (or access preferences in this report) is developed by understanding what people have previously written about disability at different points in time, and for what reason this writing was done.

Inclusive Technology – Mainstream technology that can be adapted or used easily by people with various access preferences.

People with Access Preferences – Traditionally, these are thought of as "people who have disabilities," such as sensory impairments or learning disabilities. Participants in ARCHES did not wish to be defined by such labels, but in the context of Cultural Heritage felt it was more appropriate and useful to be defined by their access preferences – NB it was understood that most if not all people have some form of access preference, even if they do not identify themselves as disabled or having an impairment. Examples of access preferences can be larger text, higher resolution sounds or easy read texts.

Technologies – In this project, this referred to digital hardware, software or firm ware, but it could also refer to mechanical devices such as wheelchairs or sensory back-packs.

2 POLICY BRIEFING

Collectively known as The Guidelines, this report evaluates the activities and exercises carried out since the beginning of ARCHES. The aim of The Guidelines is to develop ideas about how best to access, support and develop research and policies that lead to inclusion in cultural places.

2.1 The Context of ARCHES

ARCHES began as a cultural access project in 2016, to develop accessible technologies as a means of promoting inclusion for disabled people in cultural institutions. The first group was formed in London, in January 2017.

From the outset, a wider conceptualization of 'participant' was formed, one which was context dependent, and went beyond being a member of one of the single groups. It was understood that participants included all those who visited or communicated with these groups in any regular manner. In this way, as a minimum, a commitment to a collective relationship was developed. This relationship was encouraged through visits from the technologists and providing them with recordings of activities aimed at answering questions they had.

Technology and university partners produced ways-of-working documents, as did the museum-based groups, which formed a blue print for participation. This helped participants and partners recognise that everyone came with skills and experiences which could lead them in different directions.

External issues and tensions that disrupted progress arose, however. After the dissolution of the original lead partner, some technologies were either delayed or did not appear. Subsequently, a smaller number of technologies that suffered fewer delays were tested by the groups, and the results appear in the deliverables in Work Package 6. Meanwhile, the museum groups maintained their participant sessions, and looked at broader issues of inclusion and access.

2.2 The Dissemination of Findings from ARCHES

The dissemination of the findings thus far from the participant groups and broader research at the time of writing includes keynote, invited and peer-reviewed presentations at national and international conferences, workshops and university research days on four continents. In addition, the work at the time of writing is published or in press in internationally disseminated academic

journals, edited collections, monographs, charity websites, open access websites and conference proceedings.

2.3 ARCHES Research Methodology and Methods

The methodology used to gather data on museum practices, pilot studies with technologies and exercises in ARCHES is discussed in deliverables 2.1 and 2.3. This data was then analysed using grounded methodology (Hayhoe, 2012, 2019). The data used for evaluations was largely qualitative. The annex briefly outlines these methodologies.

The constraints to the research included: the project being conducted in a limited number of museums, which had their own organisational cultures and existed within particular and different European cultures; the museums were mainly art museums, and although some visits were made to alternative museums, the focus of the findings was largely limited to artworks; three of the four host cities for the participant groups were capital cities.

Data was collected during ARCHES's sessions through formal consultations within groups, interviews with participants, sound recordings of sessions and tours, visual methods, art making tasks, participant and personal observational diaries, systematic literature reviews, topical reviews based on less formal literature searches and logs by participants. The London group also employed a scribe for people with access preferences for a note taker, and this data was available as formal written data for use by the participant researchers.

During the evaluation of the participatory practice, interviews were conducted by four of the partner researchers from University of Bath and the Open University, from December 2018 through to May 2019.

For the evaluation, more than fifty people were interviewed. These interviewees included the following types of participant: supporters, facilitators, a rich mix of participants to ensure a representation of different access preferences and impairments, museum research coordinators, an education or access manager, if available a director of the museum, and the research associate from the Open University. Interviewees from the technology partners included the following participants: developers / engineers, managers.

Where interviews were conducted in Spain and Austria, interpreters were sub-contracted. In addition, it was also decided to base the evaluation questions on six "validities" – i.e. markers of successful participation - as follows: intersubjectivity, context, participation, catalytic, ethical, empathetic. In addition, tensions were also analysed and the lessons learnt were developed into further, more practical validities that need to be addressed during future participatory practice.

With the exception of the technology partners, who were interviewed via Skype, all the group interviews were conducted face-to-face, and recorded using MP3/4 recorders, tablets, smartphones or laptops.

2.4 Dissemination and Findings from ARCHES

Thus far, ARCHES participants have presented the results or models developed during the study and had publications made available or "in press". These are listed in the Annex. From this work, four models of research and practice were developed, three of which related to the participatory practice and the fourth to achieving access and inclusion:

1. Model 1 – Access and Inclusion: Inclusive Capital and Human Value – Adapted from articles by Hayhoe, Tonin & Lunardi (2017); Hayhoe (2019). In the literature, it was observed human capital was found to be an effective way of understanding our personal knowledge, activities and skills during participation in cultural heritage. In particular, human capital can also be used to show how these elements shape our personality, memory and character traits. It was also observed from studying this philosophical literature, participatory practice and evaluating case studies that there appeared to be a form of human capital developed to gain inclusion in a group. This capital was re-named inclusive capital, and its outcome was referred to as a sense of inclusion. It was observed inclusive capital was gained in a cycle of five stages: connecting and bonding with people; learning inclusive practices; collecting information; physically or virtually accessing spaces and places; mobility within spaces, networks, information and learning.
2. Model 2 – SignTime's Model for Developing the Sign Interpreter Avatar -This model is designed to guide the development of the project avatar for sign-language interpretation,

which is designed to supersede live interpreters and automated versions of photo-realistic interpreters. Museums are frequent users of sign language interpreters, with many institutions offering this service for guided tours, lectures and so forth. Filmed guides can be made available on monitors or mobile devices as users walk around museums. However, it regularly takes two days for two interpreters to record enough material for an hour's tour, and much more time is needed after filming for post-production and editing. These automated systems provide a relatively more economic and efficient substitute for live interpretation. Although SignTime's systems are at an early stage and each system must be custom built for each tour, they are now often quicker to produce than recorded videos, and therefore increased inclusion. When the avatar was first shown to the participatory groups, there was a mixed reaction. Some participants said that they preferred live interpretation, whereas other participants were highly enthusiastic. However, even those who were initially unenthusiastic often began to accept the SignTime avatar after a lengthy period of consultation and adaptation.
Having provided a rationale for using automated interpretation during ARCHES, a rationale for using avatar technologies rather than photo-realistic interpreters was developed Eventually, five primary reasons for the use of avatars over programmed photo-realistic interpreters were established:

- It was estimated that the production time of the avatar was considerably faster and the development costs considerably lower than the photo-realistic interpreters.
- It was estimated that the different, complex frames needed for a photo-realistic interpreter would require considerably greater computer memory than an avatar.
- The avatar will potentially be easier to customise than the photo-realistic interpreter in future, and adapatation of the photo-realistic image will be complicated.
- Once the avatar is standardised it may be used year after year for similar projects, however this process is considerably more complicated for the photo-realistic interpreter, as new images have to be filmed and cannot be added to old images.
- As the photo-realistic interpreter was made up of recorded frames, the signing was often less smooth than the avatar.

3. Model 3 – Participatory Practice: An Ethical Model of Participation – Adapted from a model of ethics developed within the participant groups – please see work package 8 for details. Ethically, participant groups are founded on the following three core principles: Consent, Privacy and Security/Ownership of the Data. 1) Consent and assent should be ongoing throughout the project and research teams should be alert to consent through engagement; 2) interventions and equipment should carry non-potential dangers; 3) All research notes, images and interview recordings and transcripts are stored securely and registered with the Open University's Faculty Data Protection Officer.
4. Model 4 – Participatory Practice: Cultural Difference and Participation – Adapted from an article by Helena Garcia Carrisoza, et. al. (2019). During the course of the project, the museum professionals faced challenges working with the different technology companies, which appeared to show that professionals had conflicting cultures. In particular, the technology companies' sense of participatory practice was different from the museums' in many instances. Subsequently, it was felt that the whole project would benefit from a more unified understanding of its different aspects, possibly facilitated by partners having more time to meet informally and socialise. The following list of headings summarises this model as a set of recommendations for future project designs: Overall Factors; Approaches to Attract Participants; Attending to Different Needs; Strategies for Working with Mixed Abilities; From Inside to Outside: How to Establish Communication Within the Consortium.
5. Model 5 - Participatory Practice: The While of Participation is adapted from a systematic literature review by Jonathan Rix, et. al. In looking across the fifty-four studies, multiple moments of interaction were evident, that were responsive (or not) to the participants' need. This allowed us to identify the component parts, outcomes and tensions which were in evidence in the participatory research projects. It allowed us to describe the while of participatory research. The while involves the underpinning tensions around power, support

and voice, whose participatory nature are evident in the learning, value and representation which emerge and constructed through the practicalities of participation. These components parts emerge and are constructed though: shifting language, roles and attitudes; a capacity to adapt practices and spaces that emerge from and enable relationships; a recognition of the need for being flexible, taking time, and for people to enjoy themselves.

2.5 Summary of Findings from the Evaluation

In all categories, there seemed to be two sides to participation. However, positive outcomes of the work outweighed the negatives on a number of occasions, and the tensions that occurred showed aspects that could lead to improvements. What follows is an analysis of the evaluation interviews, split into their six respective validities (ICPHR, 2013):

- Intersubjective Validity - Museum and technology partners felt their participation added to their skills-base and their knowledge of other participants. As a result, the general proficiency base of the professionals widened. Furthermore, numerous participants stated a need to learn and a social need to feel part of a community. There was also a correlation between the inter-subjective needs of participants' access preferences and catalytic validities.
- Contextual Validity - In the interviews, there seemed to be a significant correlation between the contextual and catalytic validities, and there was often a general agreement that the local communities could gain from the participatory groups.
- Participatory Validity - There appeared to be significant participation within the group and many participants provided illustrations of how they took part in the groups. The participants also generally felt they were heard by others in the group on the whole, and the coordinators and participants appeared to form a real bond – although it was felt that simply bonding was not enough to feel a sense of participation.
- Catalytic Validity - There appeared to be a correlation between contextual and catalytic validities. There was a general sense of optimism and a feeling that even small changes would lead to a greater understanding of access preferences. There was also mention in the interviews with the museum groups that ARCHES could possibly change the public's perceptions of access and inclusion.
- Ethical Validity - There was ethical validity throughout the course of the project, with the majority of participants feeling they had been treated fairly. Participants also felt that they had been treated equally and the groups sessions felt like a safe place to voice concerns confidently. However, a number of participants believed that the power other participants held could challenge a sense of fairness.
- Empathetic Validity - Empathy was amongst the strongest element of participation during sessions. After different members of the group worked with others over a period of time they noticed that participants grew in confidence and understood others more. Empathy was also expressed for the responsibility and roles of professionals. Others felt that working on the tasks also helped participants gain a sense of empathy for others' access preferences. However, this validity was tempered by a feeling that having empathy could not help form an understanding of all participants' needs completely.

2.6 Analysis of the Tensions that Arose

As stated above, the model of the While of Participation observes that tensions provide rich data and these tensions can inform inclusive practice and democratic technological design. Analysis of the tensions that occurred during ARCHES found that several issues went beyond the original evaluation's validities and allowed the participants to develop a better understanding of unique participatory practices. Consequently, this section examines the most powerful tensions that occurred during participatory practice and analyses their underlying causes during the work at hand. The most significant manifestation of these tensions was often related to the roles that each participant had or perceived they had during the project. Within this broader issue, the ambiguity of the "role of the participant," issues of power caused by these roles and the under-lying tensions that under-pinned the results emerged. Two participant roles and sub-roles emerged, with the main two roles in the project being the partner participant and the volunteer participant.

The partner participants were, by their nature “professional participants” and their roles related largely to the skills and knowledge they brought with them to the project. The sub-roles of the partner participants were the individual professions, with these three sub-roles being the technological professional, museum professional and academic professional. These sub-roles often brought their own communication and professional issues and tensions to bear. The volunteer participants were either those that had been invited to be members of the group or had a voluntary role in the participatory groups. In the voluntary, group two further significant sub-groups emerged, that of the novice volunteer and the experienced volunteer. The most significant tensions generated were between those who had different roles within the participatory groups and the broader project and between the sub-roles within each participatory group.

For example, it was observed that some volunteer participants often became dependent on individual professional participants in the group (Hayhoe, Garcia Carrizosa, Rix, et. al. 2018). Although such dependency relationships did not appear to prevent participation by volunteer participants, there were occasional complaints of favouritism by other volunteer participants. Furthermore, there was a perception by some volunteer participants of undue emphasis being placed on the voice of these “favoured” participants and the power imbalance within the participatory groups.

Similar power imbalances were also perceived within the partner participant group during the development of the technologies, with the economic culture of the technology companies being cited as a complicating factor. For example, it was felt tensions were caused by each partner thinking of themselves as an agent for their institution or class of institution. Subsequently, it was felt that the separate internal motivations of each partner complicated the evolution of inclusive technological practices.

A further contributory factor of this power imbalance between partners was felt to be caused by a lack of experience, knowledge and expertise in key outputs. For instance, it was observed that some museum professionals would not think of themselves as researchers and thus able to contribute to the technological development of the project. Within the participatory groups, there were also technical tensions brought on by the institutions themselves, with all ARCHES partners having to function within strict curatorial and management practices and policies. Subsequently, some partners found it difficult to implement the planned innovations of technology, information and practice that technology companies often required. One of the causes of this power imbalance between partners was thought to be the different roles each partner had in drafting the original proposal and subsequent contract for ARCHES. In particular, the project was perceived to be driven by technological development rather than museum-based inclusion supported by technologies. In addition, it was also felt that many of the research decisions were taken at the beginning of the research and imposed on the participant groups on the continent.

Overall, there was no single strategy that could address all the tensions. This was largely because the same tensions could have different contexts in different cultures. Furthermore, some tensions were simply unresolvable during ARCHES as they existed beyond the project. However, during the project the participants reflected, discussed and fed back on the tensions. Furthermore, the experience of working in different cultures helped to mitigate many tensions caused by differing points of view. It also helped that the project took place over a relatively long period, as many of the tensions faced took time to resolve. This information sharing and the chance to experiment with solutions over the course of ARCHES also allowed good practice to emerge and participants the freedom to reflect on their roles. Consequently, tensions and their related issues became less frequent by the end of the project.

Eventually, three underlying themes emerged that helped to relieve the most stubborn, addressable tensions. These themes were: 1) reflexivity, the ability of the project to reflect on tensions as they arose and the flexibility to develop common strategies; 2) learning, the ability of the project to learn about new situations and concepts as they arose, and to learn about other professionals, access needs and national cultures; 3) communication, the ability of the project to develop and continually use lines of communication. Therefore, it is recommended that at least three more validities based on the underlying themes that helped to resolve tensions should be considered in the development and evaluation of future projects. These validities are:

- Reflexive Validity - Whether participants can respond to lessons learnt from the project, either on a personal level or to develop their own projects.

- Learning Validity – Whether the project has significant scope as a learning project, and allows participants to learn new skills and knowledge during participatory practice.
- Communication Validity – Whether the project develops a web of communication and allows participants to communicate with each other on an equal level.

2.7 Discussion

For over a century, museums have attempted to develop models of inclusion for disabled people. However, many of these projects have siloed different access preferences.

ARCHES began with the intention of developing un-siloed participant groups in the museums of three countries. This was the first time this had been attempted, and the groups have now functioned consistently for two years or more.

Through its work, ARCHES has used participatory research and practice to develop models of participation based on participatory spaces, ethical practices developed by participants themselves, a model of cross-cultural participation and a model of inclusive capital. Thus, ARCHES has broken boundaries of participation, by connecting museum professionals, technologists and people with a range of access preferences across national boundaries.

This participatory practice has led to tensions. However, these tensions have not disrupted the business of the groups but served to improve it. Moreover, these tensions have served as lessons for participants to develop a sense of resilience and their own distinctive practice.

What is now needed is the legacy of this project to remain with all the partners and participants. Of equal importance, ARCHES must be a catalyst for future projects, funding structures and pan-European policies. Without these further steps, the developments we have worked towards will not achieve their full promise.

3 GUIDELINES AND RECOMMENDATIONS

Our recommendations and guidelines are based on the models of practice, research and evaluation discussed in the full report below, and developed during ARCHES.

3.1 Recommendations for Access and Inclusion in Cultural Institutions

3.1.1 Inclusive Capital to Develop Human Value

- During their stay at museums, parks or monuments, visitors should feel a sense of inclusion according to their own identity – e.g. whether they see themselves as visually impaired, blind, hearing impaired, deaf, Deaf or having no disability at all.
- Moreover, visitors should be given the power to determine their own cultural, social and individual needs or preferences during their visits either through prior consultation or when they arrive
- Importantly, access and inclusion guidelines, policies and practices should consider the following five stages of inclusive practice:
    - Visitors should be given the opportunity to connect or bond with people who make them feel comfortable, such as friends, family or people with similar access preferences
    - Visitors should be given the opportunity to learn inclusively either through people they feel comfortable with or alone– for example, if people want to tour museums with family members rather than with people with similar impairments, then they should be supported to do so; if visitors feel more comfortable with similar impairments, then support should be adapted to these specialist groups
    - Visitors should be given access to information that leads to inclusion and knowledge by whatever means they feel comfortable with. This access could include alternative forms of text or signing, or it could mean alternative ways of providing information, such as through telephone apps or through papers for those who refuse technology
    - All visitors should have access to public spaces and places, including cyberspace as well as a physical space. Access to spaces and places should also include considering

how visitors will get to the museum and enter and exit buildings and cyberspaces, not just how people navigate buildings
    - All visitors should have access to mobility and a means to navigate their way around the four stages above – mobility through physical and hyperspace, the ability to navigate information, mobility between different levels of learning – i.e. the potential to reach different levels of learning – and mobility with groups of people they feel comfortable with.

3.2 Guidelines for Participatory Practice and Evaluation

3.2.1 The While of Participation

- Activities within participatory projects fall into 7 broad categories:
    - Accessing information
    - Capturing ideas
    - Expressing ideas
    - Analysing information
    - Developing skills
    - Building relationships
    - Organising process
- When we consider any of these activities, the multiple interactions of participation will be happening while the activities are - through them, within them and around them.
- Participation and activity are inextricably linked. Participatory practice is therefore not about activity type but the manner in which all activity is undertaken.

3.2.2 Practical, Considerations for Cross-Cultural Participation

- Overall Factors
    - Open and transparent communication from the beginning is important for collaboration
    - No one is an “expert,” thus all voices need to be heard during participation
    - Being flexible during exercises and practice is key
    - Ensure there is a good representation of people with a wide range of access preferences at all stages of practice
    - Identify what everyone brings to the project
    - Be aware of the limitations of the project
    - There will be different rhythms of participants and partners, and flexibility needs to be shown to these rhythms
- Approaches to Recruiting Participants
    - Museums need to engage from the beginning with the recruitment process
    - The wider the recruitment scope, the richer the knowledge you will gather
    - Be prepared to spread out communication strategies and start early with recruitment
    - Give volunteers the chance to be part of the early planning stage
    - Gatekeepers may be supportive but won’t guarantee participants
    - Expect conversations about remuneration from volunteers
- Attending to Different Needs
    - Each group is different, so models from other groups will need to be adapted
    - Work by access preferences rather than impairment categories
    - Take time to get to know each other in the early stages of the groups
    - Different participants understand others’ access needs differently from their own, therefore it is again important to be flexible and patient
    - Expect requests for division of the groups according to impairment, as this is part the traditional understanding of “disabled identities”
    - Ensure all materials are accessible and creative
- Strategies for Working with Mixed Abilities
    - Create a welcoming space for all participants
    - Be aware of the power of relationships between participants
    - Everyone is in this process together, and this should be acknowledged
    - Always be alert to perceptions of favouritism and their creation

  - Know the expectations and experiences of everyone involved
  - Don't overload the participants with information, and be prepared to take extra time for exercises
  - Point out certain basic communication and operational conditions – and be consistent with the rules
  - Produce multisensory and multifaceted approaches to artworks and technologies
- How to Establish Communication Within Consortia
  - Share knowledge and previous experiences amongst participants
  - Define common goals and meanings
  - Expect everyone to understand participation in their own way
  - Evaluate each other's work constantly during the course of group work
  - Give staff time for training and re-training
  - Think about each step of the process from the start, and break down each stage of each exercise before presenting it to the group
  - Findings change during the process of participation; therefore, it should be expected that there will be few concrete findings

3.2.3 Ethical Considerations

Ethics should be negotiated with the participatory group itself, but can begin by considering the following elements:

- Consent
  - Consent and assent should be ongoing throughout the project
  - Consent should be considered through engagement and verbal or signed agreement
  - Consent should be flexible and gained through language or symbols, as long as participants feel comfortable giving it
  - Initial consent should be provisional and continue to be gained throughout the course of a project
  - Groups should be encouraged to share information and be alert to collective pressures on individuals
  - All materials should be made accessible to a range of access preferences through forms that participants feel comfortable with
- Security
  - Interventions and equipment should not carry potential dangers beyond those that participants normally face
  - Institutional staff and academics should make sure that participatory practices are not harmful to the well-being of individual participants
  - All participants should be aware of breaches of confidentiality and trust within participatory groups
  - Where appropriate, during participation academics should be required to have appropriate checks relevant to the jurisdiction they work in
- Data protection
  - All research notes, images, interview recordings and transcripts should be stored securely behind password protection, under lock and key
  - The project should be registered with an institutional Data Protection Officer
  - Participants' personal information should be kept on a secure server
  - Datasets should be separated from personal information that can identify participants
  - Images, sound files and videos footage remain the property of the individuals they represent
  - If participants feel a threat to their well-being during participation, they should have the right to remove their footage or block its use.

ANNEX

A INTRODUCTION

Collectively known as The Guidelines, this report evaluates the activities and exercises carried out since the formation of ARCHES's participant groups. The aim of the Guidelines is to develop ideas about how best to access, support and develop research and policies that facilitate inclusion in cultural places.

The Guidelines do not contain an exhaustive set of recommendations, although it reflects the experiences and practices of our participants over the course of the almost three years of study – the study was constrained by the individual cultures of the partner museums, the framework of evaluation and the unique access preferences of the participants involved in the project amongst others. Subsequently, it is written as a realistic over-view of what was achieved, given the availability of inclusive practices and technologies.

What now follows is an over-view of access in cultural institutions such as those involved in ARCHES, in order to provide the study's context.

A(i) The Context of Inclusion and Access Practice in Cultural Institutions

Inclusive practice in the arts, creative cultures and cultural heritage can be placed in a historical context of inclusion and, according to Axel (2018), this practice has passed through three eras.

The first era, from the end of the eighteenth century until the middle of the twentieth century, was that of pioneering teachers. Against the fashions of their times, these teachers worked with children with access preferences as a form of perceptual and emotional self-awareness.

In this era, the prevailing thinking was that each person's access-need was linked to their ability to enjoy or appreciate the arts and cultural heritage. In their careers, these radical teachers were thought to be attempting the impossible – or, at least the highly improbable – by developing a high-level understanding of issues such as scale and artworks through touch, description and separate classes.

The second era, in the second half of the twentieth century, was that of scientists who challenged the accessible practices of art institutions, schools, colleges and museums. These scientists suggested that what was thought to be inaccessible to people because of sensory or cognitive impairments could be taught through different sensory combinations or alternative learning strategies.

Many access issues were felt to be simple challenges that could be solved through what is now termed the deficit model (Harry & Klingner 2007). Moreover, these scientists showed that the sensory properties of objects were not restricted to those with the "full" use of their senses and cognitive ability.

Instead, it was found that objects and concepts taught in cultural institutions could have alternative information properties, and could be interpreted by various sensory and cognitive mechanisms.

According to Axel, contemporary cultural institutions are currently living in the third era of access and inclusion, and have a growing acceptance of what was once thought to be radical thinking as mainstream. Hence, many cultural institutions offer accessible art classes, inclusive technologies and tools such as accessible audio descriptions, wheelchairs and signers – either human or augmented.

For example, Axel's own organization, Art Beyond Sight, now provides drawing sets for people with visual impairments on request for use in museum art classes. Other organizations, such as ONCE (Spain), the RNID / Action on Hearing Loss (UK) and the ARCHES partners SignTime (Austria) and the V&A (UK) are organized by people with disabilities.

It was within this latter context that the ARCHES project was developed.

ARCHES began as an access project in 2016 to develop inclusive technologies as a means of promoting inclusion for people with access preferences in cultural institutions. Instead of using disabled people as passive subjects of this research, the ARCHES partners formed participatory groups, which included museum officers, technology companies, academics and disabled people

and non-disabled volunteers – this issue will be covered further in the methodology section below, and has been covered extensively in previous deliverables.

All participants belonged to groups in four cities, two of which were in Spain (Oviedo and Madrid), one of which was in the UK (London) and one of which was in Austria (Vienna). The Madrid and London groups moved between their two museums and the Vienna and Oviedo groups were based in a single museum. Again, the timings of these groups have been discussed extensively in previous deliverables and so will not be repeated here, but the first group formed was in London, January 2017.

The list of access preferences of participants represented in the groups was not exhaustive, and recruitment was based on people with difficulties associated with sensory and intellectual impairments. However, in reality, and as observed above, many of the participants that attended the sessions had multiple access preferences in unique combinations.

Due to the dissolution of the original lead partner, some of the technologies were either delayed or did not appear. However, the technologies that had fewer or no delays were tested by the groups, and the results appear in the deliverables in Work Package 6.

Meanwhile, groups maintained their participant sessions and worked on exercises related to general museum access and inclusion, and the use of mainstream technologies in the museum. Furthermore, during sessions participants visited other cultural institutions and exhibitions in their host galleries.

The dissemination of the findings from the participant groups has been broad and included – or are to be presented in - keynote, invited and peer-reviewed presentations and demonstrations at national and international conferences, workshops and university research days on four continents (Europe, Asia, Central America and North America).

In addition, observations, philosophies and models of practice have been developed and published or are in press in internationally disseminated academic journals, edited collections, monographs, NGO websites, blogs and conference proceedings – this dissemination is discussed further in section C of this Annex.

At the time of writing, the London, Oviedo and Vienna groups finished meeting to engage in exercises, although Vienna is to meet again for a celebration of its work. The final session in Madrid group is imminent. Thus, what follows in this report are the outcomes of this work and a reflection on and an evaluation of the participatory groups.

A(ii) What Follows in The Guidelines

The Guidelines are split into the following four sections:

- Methodology and methods – this section includes a discussion on the overall methodologies, data collection and restrictions encountered.
- The models developed by participants during the course of ARCHES – this section includes a summary of presentations, publications and models constructed during the course of ARCHES
- An evaluation of participation during ARCHES – this section outlines the findings of the evaluation conducted through interviews.

Conclusions

B SUMMARY OF THE METHODOLOGIES AND METHODS

B(i) Research Methodologies

The methodology used to gather data on museum practices, pilot studies with technologies and exercises in ARCHES was participatory practice. The data was strategized and analysed using grounded methodology, which was designed to analyse the data on the use of technologies and tools in cultural institutions. A full description and evaluation of the grounded methodology is given in Deliverable 6.5, and so will not be repeated in this report. However, in brief, the grounded methodology used in this study:

- was a primarily qualitative method of data analysis used in previous museum and heritage studies (Hayhoe, 2012, 2019) and is adapted from grounded theory (Glaser & Strauss, 1967)
- encouraged the evolution of interpretive deduced theories that evolve through discourse

- had three phases of analysis, with data analyzed differently in these three phases and providing a focus for the research:
    - the first phase developed categories of data
    - the second phase sub-categorised data and linked these sub-categories
    - the third phase tested the previous findings with new data

Participatory practice is a contemporary research methodology designed to include stakeholders, users of technology and visitors to cultural institutions in the development of data. This methodology also allows participants to guide the form of data that is collected, critically evaluate existing technologies and practice and provide feedback on inclusion and technologies that are created under its auspices.

The participatory approach used during ARCHES was informed by a contemporary understanding of emancipatory philosophy, dating back to the late 1960s and the Independent Living Movement. This movement coined the phrase, Nothing about us without us, which in turn became a rallying cry for people passively institutionalized to take control of their own destiny (Barnes & Mercer, 2003). In doing so, this movement asserted that:

> "[People] with disabilities are human beings with inalienable rights and that these rights can only be secured through collective political action. It arises out of the realization that, as historian Paul Longmore has written, "whatever the social setting and whatever the disability, people with disabilities share a common experience of social oppression."" (Bancroft Library, 2004))

In practice, during ARCHES this emancipatory approach promoted the engagement of participants to examine their own inclusion and support through self-advocacy and agency (White et. al., 2010). Subsequently, forms of participatory practice were implemented in partner museums by actively involving people with access preferences in the decision making and design processes. In addition, participants were asked to suggest possible uses and the contexts of uses of the technologies developed by partners.

Importantly, the work at hand was conducted using a non-classificatory approach to access preferences (Rix, 2007; Hayhoe, 2019). This approach finds that no two people have exactly the same preferences, that people should not be classified according to a single access preference – e.g. participants should not be identified as "sensory impaired" or "learning disabled" – and that everyone can be assumed to have an access preference of one form or another.

The assumption that all people have access preferences also meant that during ARCHES, technology, academic and museum partners were also found to have access preferences themselves. Therefore, their voices in the development of technologies and inclusion in the museum based on their own personal experience was seen as being equally valid as those who were recruited because of their access preferences.

As stated in the introduction and Deliverable 2.3, the participant groups met in the partner museums in London, Madrid, Vienna and Oviedo, from January 2017 to June 2019. These participant groups started with up to fifty attendees – usually the first meetings - although these numbers dropped off during the course of the project, with some attendees coming for some sessions and not others.

It was noted that this drop in attendance was often related to people's pressure of work, getting new jobs or engaging in new or alternative activities. However, others did not state their reason for leaving, and a small number left because they felt their access preferences were not being met – although twenty or more participants attended sessions regularly.

B(ii) Data Collection Methods

As stated in various deliverables in work package 6, data was collected during ARCHES sessions through: formal consultation with the groups about technological developments and use, interviews with participants, sound recording of sessions and tours, visual methods, art making tasks, participant observation diaries and personal diaries, systematic literature reviews, topical reviews based on less formal literature searches and logs by participants – it was also noted over the course of the session, that there was an increase in the participants making their own notes either on their mobile devices or using traditional pen and notebooks.

As part of its communication strategy, the London group also employed a scribe for people with hearing access preferences, who requested written information. This scribe sat next to people

who requested “sub-titling” of the spoken conversation, and this data was also available as formal written data for use by the participant researchers.

These data collection methods are discussed at greater length in the deliverables in work package 2 and 6. However, as it is part of the work at hand in The Guidelines, it is important to summarize the method of interviewing for the following evaluation of the participatory practice.

Interviews were conducted by four of the partner researchers from the Open University and University of Bath during the latter stages of the participatory groups and pilot testing, from December 2018 through to May 2019 – the interviewees were experienced social field researchers, and had previously conducted extensive evaluations. Three of the researchers who had regularly attended separate groups interviewed participants from their own groups – Jonathan Rix interviewed in Oviedo, Kieron Sheehy interviewed in Vienna and Simon Hayhoe interviewed in Madrid and London. In addition, Jane Seale interviewed participants from the technology partners.

With the exception of the technology partners, who were interviewed via Skype, all the group interviews were conducted face-to-face, and interviews were recorded electronically using MP3/4 recorders, tablets, smartphones or laptops – the software used on tablets, laptops and telephones included Evernote and QuickTime. In each of the participatory groups, the following participants were interviewed:

- One supporter from the group – this was defined as a regular attender who supported other participants through activities such as signing, translating or providing material help with mobility or similar
- One facilitator – this was defined as a participant who helped develop the groups, helping with recruitment and developing exercises
- Five participants with what were traditionally thought to have access preferences or impairments and diary keepers – this included a rich mix of participants to ensure a representation of different access preferences and impairments.
- One or two museum research coordinators
- A director of the museum if available
- An education or access manager

Jonathan Rix also interviewed the research associate from the Open University, as she had played a significant role in developing exercises and coordinating the participant groups.

Interviewees from the technology partners included the following participants:

- Two developers / engineers
- One manager

As the interviewers were native English speakers, and in an effort to coordinate interviews with the various partners, it was decided to sub-contract interpreters where interviews were conducted in Spain and Austria. In addition, it was also decided to base the evaluation questions on six validities, which had previously been developed by the Open University in previous participatory evaluation exercises (ICPHR, 2013). These six validities were:

- Intersubjective validity. For instance, participants were asked, Is the project credible and meaningful to you?
- Contextual validity. For instance, participants were asked, Is ARCHES relevant to the local situation?
- Participatory validity. For instance, participants were asked, Is this project allowing you to play a full and active part in the research process?
- Catalytic validity. For instance, participants were asked, Is ARCHES creating opportunities for social action?
- Ethical validity. For instance, participants were asked, Do you think this project is sound and just in what it is trying to achieve and the way it is trying to achieve it?
- Empathic validity. For instance, participants were asked, Is this project increasing empathy amongst participants?

Wherever possible, participants were also asked the following questions if time permitted during the interviews and the question was appropriate to the particular participant:

- Where you are and where you have been in relation to issues of access?
- What activities have you been undertaking with the participatory groups?
- What activities have people struggled with and thought successful?
- What impact has ARCHES had on you?

- What are your plans to act upon lessons learned from ARCHES?

As with all research, the data collection worked within certain constraints and, as with all projects, there were issues that affected the ability to collect data in a uniform manner. These constraints included the following issues:

1. The project was conducted in a limited number of museums, which had their own organisational cultures and existed within particular, diverse European cultures. In addition, the museums also had existing styles of providing access, rooms and exhibitions that could be made available to the ARCHES project
2. The museums worked within the normal financial constraints of contemporary public institutions, and had to account for their time carefully with a finite number of staff
3. The museums were mainly art museums, and although some visits were made to alternative museums, such as science museums, the focus on the findings was largely limited to artworks
4. Three of the four participant groups were in capital cities. Furthermore, five of the six host museums could be considered to be "national museums" or "national collections" – i.e. museums funded directly by the state. This meant that when developing a picture of "museum access," it was not possible to generalise about other specialised cultural sites, such as specialist museums, monuments, religious buildings – although, Oviedo provided useful data on regionality.

C OBSERVATIONS AND PRACTICE FROM ARCHES: DISSEMINATION & MODELS

C(i) Dissemination of the Findings from ARCHES

This list of publications and presentations reflects the experiences and practices experienced by our participants over the course of the three years of ARCHES thus far. It is designed to provide a realistic understanding of what has been learnt from the project over the course of three years, and advise for practitioners and policy makers at museums, national and local governments, NGOs and the European Union.

The dissemination thus far is represented in two tables.

- Table 1 provides a list of presentations to stakeholders, user groups and policy makers over the course of ARCHES. It details where the talks took place and the audience that heard the presentations.
- Table 2 provides a list of the publications that have been published or are accepted and in press, and result from our work on ARCHES.

In some cases, research for publications or presentations have been conducted in collaboration with other institutions, such as University of Padova, Italy, and Central St Martin's College of Art, UK. However, all were developed through the ARCHES project and are acknowledged as such.

Table 1: A List of Presentations Undertaken During ARCHES to Outside Audiences - in Chronological Order

Year & Month	Presenter(s)	Title of Event	Place of Event	Type of Presentation	Audience
2017-01.	Simon Hayhoe	The 14th Annual IEEE Consumer Communications & Networking Conference	Las Vegas, US	Demonstration	Academics, engineers, general public
2017-07.	Jonathan Rix, Jane Seale, Kieron Sheehy,	Open University Faculty of Well-Being, Education, Language and	Milton Keynes, UK	Research presentation	Academics

	Helena Garcia Carrizosa	Sport Research Day			
2017-10.	Rotraut Krall	7th European Congress on the use, management and conservation of historically significant buildings	Vienna, Austria	Conference presentation	Museum professionals, academics
2017-10.	Barry Ginley, Suzana Skrbic	University of Rome (MSc Museum Studies Programme)	Rome, Italy	Invited lecture	Academics, museum students
2017-10.	Helena Garcia Carrizosa, Jo Wood	ICOM Relevance 2017: Are we trying hard enough?	London, UK	Conference presentation	Museum professionals
2017-10.	Helena Garcia Carrizosa, Jo Wood, Andreas Reichinger	3D Imaging in Cultural Heritage Conference	London, UK	Conference presentation	Museum professionals, academics
2017-10.	Cornelia Travnicek, Andreas Reichinger	Technical University Vienna Diversity Day (October 2017)	Vienna, Austria	Demonstration and presentation	Academics, engineers, general public
2017-12.	Rotraut Krall	Open Museum: Making Art Tangible	Matica, Serbia	Conference presentation	Museum professionals
2018-03.	Barry Ginley, Suzana Skrbic	International Conference on Translation and Heritage Accessibility	Granada, Spain	Conference presentation	Academics and museum professionals
2018-03.	Felicitas Sisinni, Simon Hayhoe	Founding a Community of Practice for Sensing Culture Through Inclusive Capital	Bath, UK	Conference presentation	Museum professionals, academics, people with access preferences, artists, actors
2018-05.	Simon Hayhoe	Sensing Culture – National Conference	London, UK	Keynote presetation	Policy makers, NGOs, museum professionals, educators, people with access preferences.

2018-06.	Helena Garcia Carrizosa	European Cultural Heritage Summit	Berlin, Germany	Presentation	Academics, engineers, EU policy makers.
2018-06.	Simon Hayhoe	Seminar — A participatory museology	Leeds, UK	Conference presentation	Academics, museum professionals, students
2018-06	Felicitas Sisinni, Jara Diaz	5th International Congress on Education and Accessibility to Museums and Heritage	Barcelona, Spain	Conference presentation	Academics, museum professionals, students
2018-07.	Jonathan Rix, Jane Seale, Kieron Sheehy, Helena Garcia Carrizosa	Open University Faculty of Well-Being, Education, Language and Sport Research Day	Milton Keynes, UK	Research presentation, Keynote presentation	Academics
2018-09.	Barry Ginley, Suzana Skrbic	Inclusive Festival: Understanding Museum	Moscow, Russia	Invited presentation	Museum professionals, people with access
2018-10	Barry Ginley, Suzana Skrbic	University of Rome (MSc Museum Studies Programme)	Rome, Italy	Invited lecture	Academics, museum students
2018-11	Moritz Neumuller	Common challenges and perspectives for Digital Cultural Heritage in H2020 projects. Building on lessons learnt and strengthening the societal impact	Brussels, Belgium	Workshop	Policy makers, EU officials, academics
2018-11.	Rotraut Krall	Arte accessibile - Musei e inclusione Secondo convegno internazionale	Florence, Italy	Conference presentation and workshop	Museum professional and academics
2018-11.	Rotraut Krall	Rotary Club Meeting	Munich, Germany	Invited presentation	General public
2018-11.	Felicitas Sisinni, Jara Díaz,	VII Encuentro Transfronterizo de Profesionales de Museos: Museos y Accesibilida	Online	Conference presentation	Museum professionals

2018-11.	Felicitas Sisinni, Jara Díaz	Mesa redonda La accesibilidad en la cultura: Propuestas de intervención	Madrid, Spain	Conference presentation	Museum professionals, academics
2018-11.	Simon Hayhoe	Educational Research Association of Singapore (ERAS) and Asia-Pacific Educational Research Association (APERA) International Conference 2018	Singapore, Singapore	Conference presentation	Academics, Educators
2018-11.	Felicitas Sisinni, Jara Díaz	AMIRES	Madrid, Spain.	Round table discussion	Museum professionals
2018-12.	Felicitas Sisinni, Helena Garcia Carrizosa, Jara Diaz	ARCHES Project Presentation	Madrid, Spain	Workshop	Museum professionals, people with access preferences
2018-12.	Cornelia Travnicek, Andreas Reichinger	ICT 2018: Imagine Digital – Connect Europe, the key European ICT research and innovation event organized by the European Commission	Vienna, Austria	Demonstration	Academics, museum professional, EU commissioners, general public
2018-5	Moritz Neumuller	International Colloquium on Accessible Museums. Culture and Disability	Mexico City, Mexico	Conference presentation	Museum professionals, academics, people with access preferences.
2019-01.	Simon Hayhoe	FabLab Campana	Monterrey, Mexico	Workshop	Students, general public, academics, engineers, NGOs
2019-02.	Helena Garcia Carrizosa	iJADE Creating Spaces: Inclusivity, ethics and participation in art and design education	London, UK	Conference presentation	Museum professionals, academics, arts educators

2019-03.	Barry Ginley, Suzana Skrbic	V&A: SEND Symposium	London, UK	Conference presentation	Museum and school professionals
2019-04.	Jara Díaz, Moritz Neumuller	The Museum for All People: Art, Accessibility and Social Inclusion	Madrid, Spain	Conference presentation	Museum professionals, academics
2019-04.	Simon Hayhoe	Organisation of an Inclusive Environment in Cultural Institutions	St Petersburg, Russia	Invited lecture, workshop	Museum professionals, academics, people with access preferences, general public
2019-05.	Jara Diaz	Estudios y acción para el desarrollo de museos inclusivos	Malaga, Spain	Conference presentation	Museum professionals, academics
2019-06.	Felicitas Sisinni, Jara Díaz, Helena Garcia Carrizosa	El proyecto ARCHES. Recursos accesibles para entornos patrimoniales culturales.	Palma de Mallorca. Spain	Seminar	Museum professionals
2019-06.	Felicitas Sisinni, Helena Garcia Carrizosa, Jara Diaz	ARCHES workshop: Hacia un museo participativo: actividades inclusivas en instituciones culturales Taller para profesionales de museos iberoamericanos	Madrid, Spain	Workshop	Museum professionals, people with access preferences, general public
2019-06.	Simon Hayhoe	National Aniridia Network Conference 2019	Birmingham, UK	Invited presentation	People with access needs, academics, educators, general public
2019-07.	Jonathan Rix, Jane Seale, Kieron Sheehy, Helena Garcia Carrizosa	Open University Faculty of Well-Being, Education, Language and Sport Research Day	Milton Keynes, UK	Research presentation	Academics
2019-08.	Helena Garcia Carrizosa, Simon Hayhoe	“Global Challenges in Assistive Technology” – 15th	Bologna, Italy	Conference presentation	Academics, engineers

		international AAATE Conference			

Table 2: A Table of Published Outputs from the ARCHES Project – in Alphabetical Order

Publication Reference	Type of Publication
1. Garcia Carrizosa, H. & Hayhoe, S. (in press). Arches Project: Validation of Technological Outcomes of Gaming Software based on a Participative Research Methodology. Technology and Disability.	Extended abstract in journal
2. Garcia Carrizosa, H., Diaz, J., Krall, R. & Sisinni Ganly, F. (2019). Cultural Differences in ARCHES: A European Participatory Research Project—Working with Mixed Access Preferences in Different Cultural Heritage Sites. The International Journal of the Inclusive Museum, 12(3) pp. 33–50.	Journal article
3. Garcia Carrizosa, H., Diaz, J., Krall, R., Faye, A., Skrbic, S. & Sisinni Ganly, F. (in press). Towards a participatory museum - A how-to-guide on inclusive activities. Vienna: ARCHES.	Museum handbook
4. Hayhoe, S. (2018). Blind Visitor Experiences at Art Museums, 2: Key note presentation. London: Sensing Culture / RNIB.	Abstract and key-note paper
5. Hayhoe, S. (2018). An auto-ethnography of a hearing-impaired researcher in museum-based participatory research. Seminar collected papers — A participatory museology. Leeds, UK: Leeds University.	Abstract and seminar paper
6. Hayhoe, S. (2018). Flipping Descriptions: A new phase of democratising audio description. London: VocalEyes. (Notes from Westminster Forum, 2019: https://vocaleyes.co.uk/flipping-descriptions-a-new-phase-of-democratising-audio-description/)	Online essay
7. Hayhoe, S. (2018). Inclusive Capital & Human Value. In S. Hayhoe, Cultural Heritage, Ageing, Disability and Identity: Practice, and the development of inclusive capital., Abbingdon, UK: Routledge. (Routledge Studies in Heritage).	Chapter in monograph
8. Hayhoe, S. (2019). Classical Philosophies on Blindness and Cross-Modal Transfer, 1688-2003. In J Ravenscroft (Ed.), The Routledge Handbook of Visual Impairment: Social and cultural research. Abbingdon, UK: Routledge.	Chapter in collection
9. Hayhoe, S. & Pena-Sanchez, N. (2017). Interactive demonstration on the use of existing apps on mobile technologies to teach basic photographic techniques to participants who are blind, visually impaired	Article in Conference Proceedings

and sighted together: A demonstration of an exercise using apps and cameras on iOS and Android platforms to image 'the body' and handwriting. In 14th IEEE Annual Consumer Communications and Networking Conference, (CCNC 2017). New York, US: IEEE. pp. 622-623. https://doi.org/10.1109/CCNC.2017.7983195	
10. Hayhoe, S., Cohen, R. & Garcia-Carrisoza, H. (in press). Locke and Hume's theory of color is interrogated through a case study of Esref Armagan, an artist born blind. Journal of Blindness Innovation and Research.	Journal article
11. Hayhoe, S., Garcia Carrizosa, H., Rix, J., Sheehy, K. & Seale, J. (2018). Accessible Resources for Cultural Heritage EcoSystems (ARCHES): Initial Observations from the Fieldwork. Proceedings of the Educational Research Association of Singapore (ERAS) & Asia-Pacific Educational Research Association (APERA) International Conference. Singapore, Singapore: Nanyang University.	Conference paper and abstract
12. Hayhoe, S., Garcia Carrizosa, H., Rix, J., Sheehy, K. & Seale, J. (in press). Grounded Methodology and Developing Inclusive Technologies. In (S. Hayhoe) Grounded Methodology for Emerging Educational Researchers. Abbingdon, UK: Routledge.	Chapter in monograph
13. Hayhoe, S., Tonin, C. & Lunardi, G. (2017). A Model of Inclusive Capital for Analysis of Non-Economic Human Capital. Proceedings of Decent Work, Equity and Inclusion. Padova, Italy: University of Padova.	Extended abstract and poster
14. Neumüller, M. & Reichinger, A. (2018). Tactile Photography, in: Neumüller, M. (ed.), The Routledge Companion to Photography and Visual Culture, Taylor & Francis, New York, 2018	Chapter in collection
15. Reichinger, A., Garcia Carrizosa, H. and Travnicek C. (2017). Designing an interactive Tactile Relief of the Meissen Table Fountain. ICCHP Conference Proceedings.	Journal article
16. Reichinger, A., Garcia Carrizosa, H., Wood, J. Schröder, S., Löw, C., Luidolt, L.R., Schimkowitsch, M., Fuhrmann, A., Maierhofer, S. & Purgathofer, W. (2018). Pictures in Your Mind: Using Interactive Gesture-Controlled Reliefs to Explore Art. ACM Transactions on Accessible Computing, 11(1), article no. 2.	Journal article
17. Rix, J., Seale, J., Garcia Carrisoza, H., Sheehy, K. & Hayhoe, S. (submitted). The while of participation: A systematic review of participatory research involving people with	Submitted Journal Article

sensory and/or intellectual impairments. Disability & Society.	
18. Rix, J., Seale, J., Garcia Carrisoza, H., Sheehy, K. & Hayhoe, S. (submitted). Emergent analysis and dissemination in participatory research. International Journal of Research & Method in Education.	Submitted Journal Article
19. Rix, J. (In press) Normal ways for normal days – Building our practice upon the exploration of people's preferences in Cooper and Holford (eds) Exploring childhood and youth. Publisher TBC.	Chapter in collection
20. Seale, J., Garcia Carrisoza, H., Rix, J., Sheehy, K. & Hayhoe, S. (2018). A proposal for a unified framework for the design of technologies for people with learning difficulties' Technology and Disability, 30(2):25-40. https://doi.org/10.3233/TAD-180193.	Journal article
21. Sheehy, K., Garcia Carrisoza, H., Rix, J., Seale, J. & Hayhoe, S. (in press). Inclusive museums and augmented reality. Affordances, participation, ethics and fun. The International Journal of the Inclusive Museum.	Journal article

From the work at hand, five models of research and practice were developed, three of which related to the participatory practice and the fourth and fifth for achieving access and inclusion. These are discussed below through extended abstracts.

C(ii) Model 1 – Participatory Practice: The While of Participation – Adapted from a systematic literature search by Jonathan Rix, et. al.

In the literature, underpinning tensions between power voice and support were also observed. These tensions were most evident in outcomes of studies, which were described as "representing lives, moments of learning and value to selves." Subsequently, tension between practicalities of participation are experienced in their component parts. This overarching explanation can be seen as the while of participation.

The while of participation involves the underpinning tensions around power, support and voice, whose participatory nature are evident in the learning, value and representation which emerge and constructed through the practicalities of participation. These components parts emerge and are constructed though

- shifting language, roles and attitudes
- a capacity to adapt practices and spaces that emerge from and enable relationships
- a recognition of the need for being flexible, taking time, and for people to enjoy themselves.

The underpinning tensions, outcomes and component parts can be seen as multiple moments of interaction of participation, but of the kind evident in an Escher painting (see Figure 1). These moments lead both upward and downward, inward and outward, forward and backward and may be both positive and negative. These moments form around each other, but they are also the layers through which we can understand the activities identified within the review and people's experiences of them.

Figure 1 – The tensions, outcomes and component parts within the multiple moments of participatory research

The while of participation also argues that the research space between all participants (those with access needs, researchers or stakeholders) is a "messy space." This messy space allows people to work together, gives preference to formal or improvised approaches, and draws upon plans and rules or in-the-moment responses to their position within this space.

These understandings of participatory practice set up a range of contradictions in relation to data and its analysis. Knowledge and learning is inextricably linked to participation. It arises within the while of participation.

If this knowledge and learning is our data within the research context then we must recognise the data as emergent; and to be participatory, its analysis also needs to be emergent, understood as part of the while. Analysis outside of the while as a retrospective process (for example thematically analysing transcripts) creates two contradictions which argue against its use:

- The retrospective activity will by its nature create a new source of participation, a new source of knowledge and learning, a new source of data. The analysis will be data, revealing an experience of participation. It sets up a never-ending shortfall.
- The retrospective process privileges particular kinds of knowledge and particular capacities and thereby calls for mediation of the data. This mediation compromises both the nature of the participation and the 'reality' of what is being presented to participants.

In order to build on the possibilities that these contradictions create and minimise the marginalisation, ARCHES developed an emergent approach to data analysis, using ongoing participant verification. This analysis involved reflecting on experience, sharing understandings and insights from that experience, summarising those experiences, recording them and the resubmitting them to participants for clarification and verification. This emergent ongoing analysis typically occurred shortly after experiences occurred, but it could also take a longer view (for example across one of the group's projects) providing snapshots on the way to producing a final representation of that experience (for example a video or a tapestry).

C(iii) Model 2 – Participatory Practice: An Ethical Model of Participation – Adapted from a model of ethics developed within the participant groups

This model was previously presented in Deliverable 8. However, to summarise this model, participant groups collectively formulated the following three core principles of ethically engaging with their groups: Consent, Privacy and Security/Ownership of the Data.

Firstly, it was felt consent and assent should be ongoing throughout the project and research teams needed to be alert at all times to this consent through engagement and verbal or signed agreement. Consent was gained through language or symbols that participants felt most comfortable using.

Consent was also provisional and continued to develop within each participant's expectations. Subsequently, the groups were encouraged to share information and were alert to collective pressures on individuals. Materials were also made accessible to a range of access preferences and informed consent was always asked for.

Secondly, with reference to security, it was felt that interventions and equipment should carry non-potential dangers beyond those that participants normally faced. Museum staff and academics also made sure that participatory practices were not harmful to the well-being of individual participants, and everyone was aware of breaches of confidentiality and trust within participatory groups.

Where appropriate, during the course of participation partners working with groups needed to undergo safe-guarding to ensure the well-being of participations.

Thirdly, security considerations were a key aspect of the research approach to the data after the groups met. For instance, all the research notes, images and interview recordings and transcripts were stored securely behind password protection, under lock and key and the project was registered with the Open University's Faculty Data Protection Officer. The participants' personal information was also kept on an Open University secure server and datasets were separated from personal information that could identify any participant.

Another important consideration was the images, sound files and videos footage were the property of the individuals they recorded. Subsequently, if anyone was recorded during the course of their participation and they felt this threatened their well-being in some way, they had the right to their footage or to block the use of the footage.

C(iv) Model 3 – Participatory Practice: Cultural Difference and Participation – Adapted from an article by Helena Garcia Carrisoza, et. al. (2019)

Approximately halfway through the course of the participatory groups it was observed that the aim and focus of individual participants shifted and value lay in working with mixed participatory groups. However, one of the most significant challenges was cultural differences are not only nationalistic they were also affected by museum cultures and how each institution worked.

For example, although they had fewer resources smaller museums tended to be more flexible, whereas bigger museums tended to face more restrictions and departmental structures when making changes.

During the course of the project, the museum professionals also faced challenges working with the different technology companies, which appeared to show that professionals had conflicting cultures. In particular, the technology companies' sense of participatory practice was different from the museums' in many instances.

Furthermore, the technology companies' concepts of how the sessions run and how the group worked as a whole was, in many cases, considered to be similar to clinical testing.

Subsequently, it was felt that the whole project would have benefited from a more unified understanding of its different aspects, possibly facilitated by partners having more time to meet informally and socialise. This, it was felt, would have led to more open communication. Table 3 summarises the main findings from the cultural differences observed during the course of participating in the project, designed as a helpful tool when establishing a similar project.

Table 3: Recommendations for Future Project Designs

Overall Factors	
•	Open and transparent communication from the beginning is important for collaboration
•	No one is an “expert”
•	Being flexible is key
•	Ensure there is a good representation of disabled people through all the stages
•	Identify what everyone brings to the project
•	Be aware of the limitations of the project
•	There will be different rhythms of participants and partners
Approaches to Attract Participants	
•	Museums need to engage from the beginning with the recruitment process
•	The wider the recruitment scope, the richer the knowledge
•	Be prepared to spread out communication strategies and start early with recruitment
•	Give pioneers and volunteers the chance to be part of the early planning stage
•	Gatekeepers may be supportive but won’t guarantee participants
•	Expect conversations about remuneration
Attending Different Needs	
•	Each group is different
•	Work by access needs and preferences rather than impairment categories
•	Take time to get to know each other
•	Participants understand access needs differently than what you may expect
•	Expect requests for division of the groups according to impairment
•	Ensure all material is accessible and creative
Strategies for Working with Mixed Abilities	
•	Create a welcoming space for all
•	Be aware of the power of relationships between disabled and nondisabled people
•	Everyone is in this together
•	Always be alert of perceptions of favoritism and their creation
•	Know the expectations and experiences of everyone involved
•	Don’t overload the participants
•	Point out certain basic communication and operational conditions
•	Produce multisensory and multifaceted approaches to the artworks and technology
From Inside to Outside: How to Establish Communication within the Consortium	
•	Share knowledge and previous experience
•	Define common goals and meanings
•	Expect everyone to understand participation in their own way
•	Evaluate each other’s work constantly
•	Give staff time for constant training
•	Think about each step of the process from the start
•	Results transform during the process

C(v) Model 5 - Model for Developing the Sign Interpreter AvatarThis model is designed to guide the development of the project avatar for sign-language interpretation, which is designed to supersede the recording of live interpreters and the production of automated versions of photo-realistic human interpreters. This model is split into two parts: the first part examines the context of developing automated interpretation over live translation, and the second part examines the rationale for using an avatar rather than a programmed photo-realistic sign-language interpreter.

The Context of Automated and Live Translation

There is a shortage of trained sign language interpreters. For example, in Austria, where the sign-language avatar designer, SignTime, is based, there are one hundred and sixteen interpreters for approximately eight thousand sign-language users. A further complication is that many live sign-language interpretation sessions need two signers, as the pressures of signing leads to frequent mental fatigue and communication errors. Subsequently, the demand for qualified

interpreters at live events, in institutions, on mass-media, such as television signing, or for public information, such as signed information on bus and train monitors, frequently out-strips demand and is expensive.

Museums are frequent users of sign language interpreters, with many institutions offering this service for guided tours, lectures and so forth. The most realistic alternative to live translation at present is filmed guides that can be made available on monitors or mobile devices as users walk around museums. However, it regularly takes two days for two interpreters to record enough material for an hour's tour, and much more time is needed after filming for post-production and editing. Thus, filming can often be economically unrealistic and causes exclusion and inequity as a result.

Recently, automated systems, such as SignTime's avatars or photo-realistic interpreters adapted from live video, have been developed. These automated systems provide a relatively more economic and efficient substitute for live interpretation and have been found to at least partially fulfil the excessive demand for live and recorded sign-language interpreters. Although SignTime's systems are at an early stage and each system must be custom built for each tour, they are now often quicker to produce than recorded videos, and do not require large, costly teams or film studios to produce film output. Thus, the automated sign-language interpretation produced for ARCHES's videos, games and Sprout was relatively more affordable and time efficient than studio-recorded film – and therefore increased inclusion.

However, when the avatar was first shown to the participatory groups, there was a mixed reaction. Some participants said that they preferred live interpretation, as they found it took time to get used to individual styles and accents of interpretation, whereas other participants were highly enthusiastic. For instance, one participant explained, "I really enjoyed that, that sticks in my mind as being really, really cool." Moreover, even those who were initially unenthusiastic often began to accept the SignTime avatar after a lengthy period of consultation and adaptation. Consequently, participants from the museum themselves saw advantages to the system:

> "I think now [ARCHES sign-language users] understand, now that they worked on it, actually it is, you know, beneficial ... I don't know that's going to happen and things like if SignTime crack this tech where eventually - and they will eventually I think ... where you can just input like gallery labels into a computer and then an Avatar [and it] pops out signing it, I mean that will absolutely transform the way [we experience] a museum."

Rationale for Using an Avatar Rather Than Photo-Realistic Signing Figures

Having provided a rationale for using automated interpretation during ARCHES, a rationale for using avatar technologies rather than photo-realistic interpreters was developed – photo-realistic interpreters are images of real interpreters schematised and developed into a series of frames and algorithms that can then be used for automated sign-language interpretation. Eventually, five primary reasons for the use of avatars over programmed photo-realistic interpreters were established:

1. It was estimated that the production time of the avatar was considerably faster and the development costs considerably lower than the photo-realistic interpreters. There are two reasons for this: 1) filming a human making a large number of signs will take a long time, especially if several takes are needed and the interpreter is given frequent breaks during filming; 2) hiring a studio for filming and a production team during the development of the photo-realistic interpreter will be very costly, as will post-production editing and software development.
2. It was estimated that the different, complex frames needed for a photo-realistic interpreter would require considerably greater computer memory than an avatar. Thus, only higher end mobile phones and tablets would be able to show the avatar, and the processing speed would be considerably slower, stymying functionality in many instances.
3. The avatar will potentially be easier to customise than the photo-realistic interpreter in future, and adapatation of the photo-realistic image will be complicated. Eventually, it is planned that the user will also be able to customise or re-design their own avatar based on their own preferences and needs – they can either reflect themselves in these images or produce an avatar that is similar to an interpreter they feel comfortable with. If an avatar is adapted, the user will be able to do this themself. However, if a photo-realistic image is used this will be more complex to adapt or a real interpreter will need to be filmed again.

4. Once the avatar is standardised it may be used year after year for similar projects, however this process is considerably more complicated for the photo-realistic interpreter, as new images have to be filmed and cannot be added to old images. In the past, SignTime found it difficult to maintain continuity of sign-language interpreters during filming. For instance, interpreters changed their hairstyle, put on or lost weight, or grew facial hair. Even if they did maintain their "look," they aged and so a whole new set of frames and signs needed to be recorded.
5. As the photo-realistic interpreter was made up of recorded frames, the signing was often less smooth than the avatar. Again, it was estimated that the processing power needed to show or alter the image of the photo-realistic figure would be considerably greater, and the image on screen and the figure's signing would be considerably more jittery than an avatar. In addition, it was estimated that the algorithm for the avatar was considerably easier to adjust and customise to the needs of the user.

Co-Development of the Avatar with the Participatory Groups

After establishing its rationale for using avatars, SignTime sought the feedback of participants to co-create the specific images, focussing on the following two aims: 1) the signing had to be comprehensible, 2) the look of the avatar had to be appealing to its user. After consulting the participatory groups about these aims, several issues were identified by the groups and changes made to the avatar before being made available to the other technology companies and museums. SignTime summarized these changes as follows:

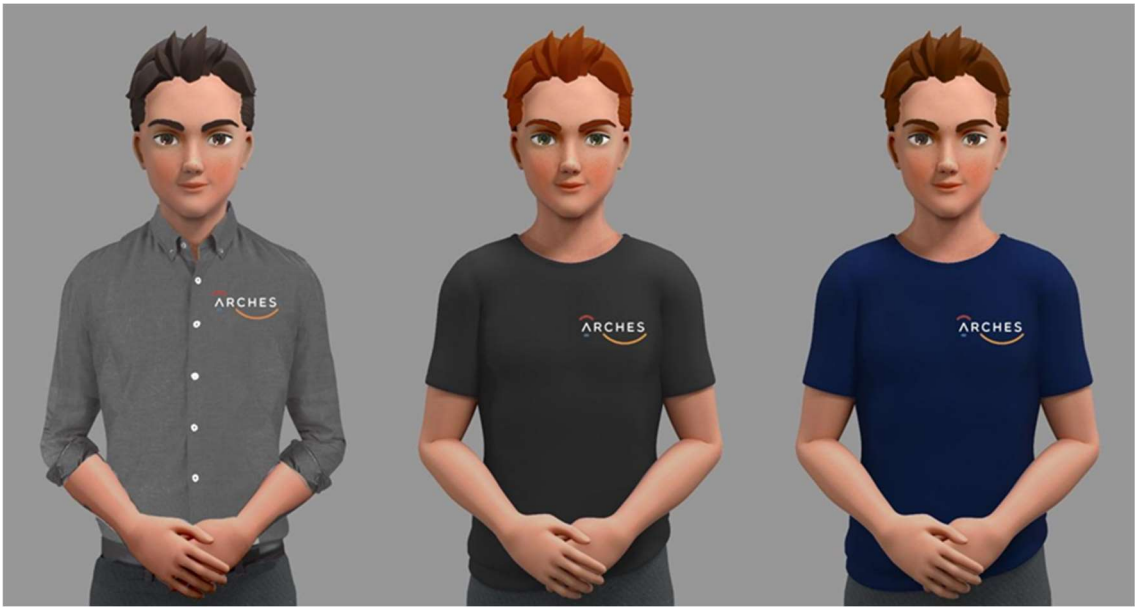
- Grammatical facial expressions, like questions, which were marked with raised eyebrows in sign language, mouth gestures, adverbs and line of sight were improved.
- The intensity of the body movement was improved. This was required when the avatar needed to prompt the viewer to act or understand emphasis. It was a challenge for the 3D animators to develop a stronger body movement for the avatar, as there are body movements which look natural on human signers but stranger on avatars. This meant animators could not simply copy human movements and had to develop custom algorithms.
- SignTime linked the artwork and the avatar by visual means using three iterations of videoing:

1. In the first iteration, the artwork is not shown, only the avatar is.
2. In the second iteration, the painting can be seen in the background of the video while the avatar is positioned on the right side of the video. Whilst the avatar is referring to one figure in the painting, this figure is enlarged on-screen so that he or she can be seen better. In addition, the figure's surroundings are changed to grey, whilst the figure maintains its original colour.
3. In the third iteration, the avatar is only signing after the emphasised figure is enlarged on screen, so the viewer can concentrate first on the detail of the painting and then on the signing.

- SignTime developed the aesthetics of the avatar to suit the different national cultures of the participatory groups, and the individual activities of each group. In one instance, for example, the project partners created their own video explaining the aims of ARCHES with the participants presenting the project verbally and the avatar interpreting through sign language. This video was produced in the three different sign languages – British, German and Spanish – and during video production the participatory groups co-created the following avatar images.

After consultation, these images were created with a rather “serious”, professional look, such as that of a curator, and the final gender of the avatar was canvassed. The participatory research group in Austria voted for the avatar to be a man by a slight majority, whereas the London group didn’t mind either. Both the London and Vienna participatory groups also suggested that there could be an alternating male and a female avatar. On a practical level, all the sign-language users in the participatory groups pointed out that the male avatar should not wear a beard as it covers the mouth and lip-reading is restricted. As some participants commented, “The beard should be taken off because it’s a bit [distracting].” “The man in the photocopy can just about get away with this, but it is very hard for someone who is new to lip reading to see the lip-patterns on the mouth with a beard in the way.”

Following this initial phase of co-creation, more ongoing consultation and co-creation was undertaken with the participatory groups, and this led to several different versions of the male avatar. This notion was particularly supported by the Spanish participatory group, who decided that images with darker coloured t-shirts, more mature skin without freckles and conventional hair styles were more appropriate.



C(vi) Model 6 - Access and Inclusion: Inclusive Capital and Human Value – Adapted from articles by Hayhoe, Tonin & Lunardi (2017); Hayhoe (2019).

In a philosophical review of human value and inclusion for ARCHES, it was observed that human capital has evolved chronologically from the eighteenth century through to the early millennium. Human capital is the skills and knowledge we possess that allows us to gain inclusion or access social or cultural institutions, mix with people and most importantly to feel valued in our surroundings.

For example, cultural human capital can be a knowledge of books that allows us to discuss them in class, study skills and habits that allow us to learn about paintings, the way we talk that makes people want to accept us. Similarly, social human capital can be informal knowledge that helps us gain acceptance in a peer group, such as “street” knowledge we learn as teenagers or our use of humour.

Consequently, human capital was found to be an effective way of understanding our personal knowledge, activities and skills during participation in museum. In addition, human capital can also be used to show how these elements shape our personality, memory and character traits.

For instance, it was observed from the literature that human capital shapes practices, individual identity and behavior, or our ways of thinking about motives and human desires. These practices, behaviours and identities included those we noticed during participatory practice.

For example, our communication rules were a good example of soft-skills participants developed between themselves to be able to communicate effectively. Similarly, the practice of walking through galleries allowed our participants to learn about and then critically evaluate the “rules” of being in a gallery. Even the practice of critical evaluation of exclusion in the galleries could be seen as a social skill they developed during the groups.

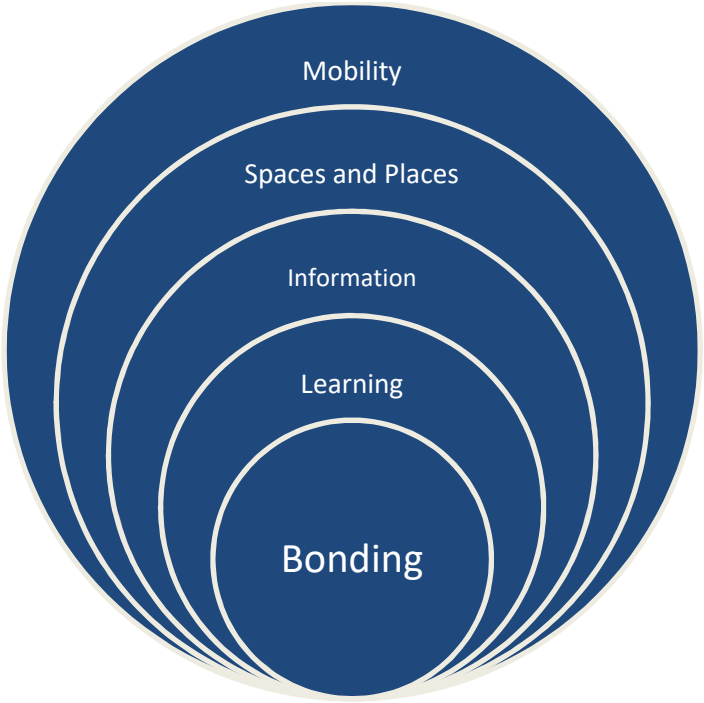
Eventually, it was observed from studying the philosophical literature, participatory practice and evaluating case studies that there appeared to be a form of human capital developed to gain inclusion in a group. This capital was called inclusive capital, and its outcome was referred to as a sense of inclusion.

Importantly, and again through evaluating literature and participatory practice, it was observed inclusive capital was gained in a cycle of five stages:

1. The first stage in this cycle is connecting and bonding with a network of people. Perhaps obviously, the participatory groups themselves were a good example of this bonding, with many developing friendships and kinship through the group.
2. The second stage is learning inclusive practices through these networks. Consequently, learning inclusive capital consisted of learning when to speak, when to “speak-up,” to whom a point could be made and the gaining of a sense of justice.
3. The third stage is collecting information that leads to knowledge. In the participatory groups this could be as simple as developing travel plans, participants finding out about their surroundings or participants finding a new app or symbol through Google.
4. The fourth stage is physically of virtually accessing spaces and places, such as visiting or attending cultural institutions, or reading about their collections and history through cyberspace. In our participatory groups, participants found their way around the museum, attended exhibits and conducted “mystery shopper” visits to other museums in order to evaluate their spaces and places.
5. The fifth stage in this cycle is mobility, and is a form of capital that weaves its way through the other four stages. For example, mobility enabled participants access to gallery spaces, and caused exclusion when access to tools such as wheelchairs or a clear path were not available. Mobility during participation also allowed the participant researchers to bond with groups in different countries physically or through hyper space.

   These five stages are represented in Figure 2.

Figure 2: The development of inclusive capital and a sense of inclusion



D ANALYSIS OF THE INTERVIEWS WITH PARTICIPANTS

D(i) Summary of Findings

In all categories there seemed to be two sides to participation, with some tensions emerging from professionals in particular and more minor tensions emerging within the group. However, positive outcomes of the work outweighed the negatives, and the tensions raised interesting aspects that were particular to the local contexts and the size of museum partner.

What follows is an analysis of the interviews collected for the evaluation, split into their six respective validities.

D(ii) Intersubjective Validity

The intersubjective validity questions generated some of the most positive responses during the interviews, and was amongst the strongest elements of participation. The museum staff in particular felt their participation added to their skills-base and knowledge of participants.

During the course of the participatory groups, even the most experienced staff seemed to find something that increased their knowledge – particularly their experiences of working with people whose access preferences they had not previously come across. Moreover, it was felt that the longevity of participatory groups had allowed museum professionals to delve into issues they had come across before but in greater detail. As a result, the general proficiency base of the museum professionals widened.

For instance, one museum professional stated that she found the project had raised her awareness of a range of different challenges that some of her visitors faced. This issue had come as a surprise, as she had previously worked with visitors with a range of disabilities in her museum and felt this experience was transferable to ARCHES. For instance, before ARCHES she stated she felt as if she had a “fairly good grip” on access issues, but over the course of two years she had realized,

> “So, it's been enlightening, it's also been a bit terrifying and it's been enjoyable and it's been frustrating but it's definitely been meaningful.”

Similar sentiments were expressed by partners from technology companies. For example, one technology professional felt it was interesting to work with people from museums in particular,

as it helped them gain insights into the way they thought about access. Similar sentiments were also discussed about working with academics:

> "But here again, this has a strong academic part and I like it. Because I liked university, I like science. I think this is a very good way to see and analyse the world"

For the participants, two forms of need were fulfilled more than others during the course of group participation: firstly, there was a feeling they were a productive part of a live project, a productive part of society and that they were recognized by the museum, universities and technology companies; secondly, the participants felt their voices actually led to some form of inclusive activity, some form of tangible change, and it was this change that provided self-esteem.

In this respect, there was a correlation between inter-subjective needs of the participants with access preferences and the catalytic validities. Furthermore, numerous participants with access preferences stated a need to learn, a need to feel part of a group or a movement and a social need to meet with friends and feel a part of a community. Through the group activities and active practice, they also saw a need to feel the museum was a place to look forward to visiting.

For instance, a participant with access preferences felt the sessions allowed them to gain access to the Kunsthistorisches Museum, familiarize themselves with exhibitions and follow guided tours, which they would not have normally followed. These experiences had been important for him to help to shape access he had not previously considered, and activated a need to develop inclusion in the museum,

> "I want barriers to disappear, I want there to be more accessibility and I want museums to be inclusive and I'm someone who can contribute to this."

For many of those participants who felt they were making a difference, it was also important to develop intellectual and critical skills during the course of the groups, which in turn led to a sense of self-esteem and achievement. Some participants took this aspect of the group further and, acting on their own initiative, attempted to undertake their own exercises after individual sessions had finished. For instance, one participant described the following self-directed exercise after a participation session:

> "Afterwards, we all dispersed. I stayed on at the museum and I done a little mystery shopper of my own. It's fantastic, you can go to the information desk for information, you can ask them [if] they have an iPad. They will put it straight on to BSL. Up pops the little man and he signs everywhere."

There were, however, instances where participant sessions did not fulfil intersubjective needs. Reasons cited were largely those of a lack of technology appearing or the participants feeling they were not intellectually or professionally stimulated by the tasks at hand. In other instances, people attended because they were interested in technology but had little interest in the museums themselves or art.

For example, one participant discussed sessions where she felt presenters had just come, talked about an interest and left. It was as if these presenters had little "buy in" to the project, which left participants feeling demotivated and slightly disappointed about attending. As she stated:

> "I think there was one about a design museum or an exhibition about something and the lady came in and did a presentation and it was quite complicated. I think a lot of it went over the participants' heads, and they left, and it wasn't linked to an active project that we were doing."

In other instances, there were tensions between participants with different access preferences and different levels of experience in access environments. For instance, there was particular frustration by some participants that their expertise was not recognized and they were not remunerated. In addition, it was felt by some that the speed of sessions was often too slow and paced towards those who learnt slowest.

> "A project which aims at addressing all sorts of disabilities at once reduces persons with disabilities to being disabled. A real participatory project would bring together, for example, people with cognitive disabilities and journalists or blind persons and architects. Disabilities are not an amorph something which is just "other than normal". There is a great variety inside disability which has to be respected in order to meet the people's individual srengths and disability-related needs. Combining blind people and people with cognitive disabilities in a series of workshops leads to boring hours without occupation for both sides, since the contents these two groups can work on are often different.

> The one-and-for-all tool for people with disabilities does not exist and will never exist. A good example is the game in the app which can now - after months and months - be played with VoiceOver output, but which is no fun for non-seeing people." [Personal Communication from Members of Vienna Group to VRVis]

D(iii) Contextual Validity

In the interviews, there seemed to be a significant correlation between the contextual and catalytic validities, and there was a general agreement that the local communities could gain from the participatory groups. Many of the regular members of the groups thought that ARCHES could lead to a change in their local communities, expressing aspirations in particular about modifications to information and public transport.

In contrast, the museum professionals mentioned more concrete contextual changes that could come about, based on their previous experiences of working in this field. These changes often related to practicalities, the size of the museums and the ability to link like-minded institutions rather than local cultural issues beyond the museum.

For instance, it was felt that ARCHES helped individual museums develop unique technologies they would not normally be able to afford as a collective. It was also felt that ARCHES could bridge a gap between large and small museums, allowing for diverse participatory experiences.

For example, it was felt that combining two very different museums, the relatively small Museo Lazaro Galdiano and the larger, national Museo Thyssen benefitted both parties. For instance, the Lazaro Galdiano managed to focus more on the human dimension of participation and the Museo Thyssen managed to work with different forms of art and craft:

> "The combination of these two museums has given the project a fuller perspective."

Similar sentiments were expressed by other museum professionals. For example, a participant from the Wallace Collection felt both the Wallace and the V&A could learn from each other and forge stronger, long-term links. This was particularly important for the Wallace Collection, who could not normally afford expensive custom-built technologies for access purposes, as it was a smaller, specialist collection:

> "where we can't really afford to put money into developing any kind of new tech or new audiences, let alone our underrepresented audiences."

Participants from all four groups also felt that ARCHES could help local institutions and make particularly make local communities more aware of disability access and rights. However, for these participants the notion of helping and raising awareness in the local community seemed a little more abstract vision for the future, rather than something that could happen immediately. Consequently, during the interviews few could give specific examples where they would see specific changes, beyond broad aspirations.

> "It's what we're doing, we're going to make the museum more accessible to people with disabilities whether they have a learning disability or whether they're deaf or partially deaf, or blind or partially blind, deaf/blind, so we're looking into all that."

D(iv) Participatory Validity

On a local level, there appeared to be significant participation within the group and many participants provided colorful illustrations of their group participation. The participants also felt they were heard by others in the group on the whole, and the coordinators and participants appeared to form a real bond.

However, it was also mentioned that simply bonding with those who ran the group was not enough to feel a sense of participation. Of greater importance was a need to feel that what was being discussed during group sessions was acted upon, or at least could lead to future action. In this respect, being listened-to and providing some evidence of inclusion in an output seemed to be correlated with a sense of feeling valued.

For instance, participants in both Spanish groups felt that when they gave feedback it was generally acted on, there was a viable change in the coming days and their ideas for activities came from the groups themselves. Participants also generally recognized that coordinators put in a

great deal of hard work outside the sessions to make them interesting and they had not been blocked when their opinions were offered.

> "He [the participant] thinks he's being listened to within the project and he actually thinks that the participants are protagonists of the project, so he feels like they are really being listened to in order to improve the conditions of accessibility within the Museo."

Groups also often felt like a family and participants made many friends during the course of the study, despite not expecting to do so when the sessions began. In addition, a number of participants felt the group coordinators were flexible, dedicated and had driven the project forward. To comply with their objectives, they stated that a number of outcomes had been set prior to activities, and these helped to focus the project.

> "So, of course, we are not only listened to. Our ideas, suggestions and works are not only taken into consideration but it's the only way that the project is working, because if we couldn't do that the project wouldn't have started"

Many of the museum professionals also felt as if their participation was appreciated and their voices heard during the course of the sessions. A number stated that it did not just feel as if they were doing their job or going through the motions because they were paid to attend. The professionals stated they felt valued for what they did, nice about what they did and built lasting relationships with colleagues and the participants recruited for their access preferences.

A number of professional participants also felt that although it was tough working with those from other disciplines, the effort and difficulty was worth it in the end. Even the postponement or lack of some technologies to test appeared to provide a sense of resilience.

> "It's been interesting to work with them [other professionals] too, even though there's been problems and delays … but they're all incredibly dedicated and understand what it is we're trying to do I think on the whole and have tried very, very hard to understand issues of participants."

However, although many of the regular participants felt as if their voices were being valued, a few participants felt that some voices were over-valued over theirs within the group. In other instances, one or two participants felt intimated by other participants as they seemed more confident.

In addition, it was found that some staff members did not feel valued, largely because they felt they were following a route map they had not helped to construct. In other instances, participants were unsure of their role in the group and, as the technologies had not appeared as quickly as they expected them to, tensions had occurred in the group. This led to some professionals having lesser fulfilment in the project, and feeling their participation was being tinged by a sense of omission and a loss of ownership.

For others, there was a feeling that the workload ARCHES produced left them reeling from the experience. For instance, one museum professional said they felt constrained by the amount of work, or having to leave decisions to others in the museum.

> "It's been hard in that me and [Co-Worker] split one day a week on ARCHES, other people work full time and that's, for me, it's created a problem in that … I have two other massive programs that I run, this is a tiny part."

There were instances of groups and individuals who stopped coming and it was not clear why. In other instances, it was stated that people had been asked to work with technologies that weren't in their native language or had adapted settings that hadn't been adjusted beforehand. Others felt a gap between their aims, the universities' and the technology partners', with others also feeling that it felt as if there was a hierarchy of participants being imposed on them:

> "The project was made up of some companies' project ideas which had been developed before the project started. The persons with disabilities had the role of testers, but we had no influence at all on the development. A project which excludes people with disabilities from its development will never be able to meet these persons' needs and cannot be labelled participatory …
>
> Time is precious, even to persons with disabilities. And expertise is precious, life-based and rare expertise is even more so. The ARCHES project demanded the expertise of people with disabilities. Three hours every two or three weeks for more than a year - without any form of remuneration. I felt that the project workers in Vienna (khm, vrvis) appreciated our expertise very much, but I missed any respect for my time and my expertise in the project design." [Personal Communication from Members of Vienna Group to VRVis]

D(v) Catalytic Validity

As previously stated, there appeared to be significant correlation between contextual and catalytic validities, with the contextual being reported in a more concrete way during the interviews. However, there was a general sense of optimism amongst all forms of participant and a general feeling that even small changes, such as video projects, would lead to a greater understanding of access preferences. There was also mention in the interviews with the museum groups that ARCHES could possibly change the public's perceptions of access and inclusion.

Furthermore, catalytic validities were frequently also closely-correlated to empathetic validities during the interviews, or at least to developing a sense of empathy with other participants. It was also felt that small changes in practice after attending the groups could help develop a momentum at an institutional level, and lead to more significant changes in future.

For example, one of the museum professionals felt that tangible resources and their promotion often helped to disseminate the idea of access and equality better than projects alone. Furthermore, the professional felt that the effect of promoting technologies was often exponential. Importantly, when resources such as bigger signs explaining pictures and audio guides were used in real-life settings, then it was felt that others saw accessible issues up-close and museum visitors saw accessible resources as normal.

Indirect catalytic practice was also thought to be significant, leading to further understanding of access and inclusion issues amongst the participatory groups. For example, one professional described that developing a video allows it to be put on their museum's website. This website will help the group gain recognition amongst casual viewers of the website, both those who consider themselves to have access preferences and those who don't.

> "The video presentation and all the resources available, will achieve a normalization of the disability … So, the social impact has to be done with this type of littlest stones, littlest steps, but that will make sense at the end of the day."

Similar catalysts were described by the technology partners who felt their practice in future projects could be positively affected by their experiences in ARCHES. For instance, one technology partner explained that the whole participatory process was new to them, and they had no model of approach when they visited the London group – the first group to be formed.

Although the partner found this experience challenging they also found it positive, developed resilience and learnt issues about different access preferences they had not worked with before. They described the whole experience as highly enriching. Similarly, another technology partner felt the ARCHES project had changed their understanding of how technology could be truly inclusive:

I think for me personally it opened a little more even the horizon of what is an inclusive technology versus an adaptive technology. And where it's inclusive, more inclusive led the best option, or where is it better to adapt to specific needs of specific people, and why can that also mean inclusion."

Although the greater majority of participants thought that ARCHES sessions would lead to changes, others were less optimistic and felt that step changes would be small. One museum professional for example was less-committal when answering, feeling that the changes would be less perceptible than the rest of his group.

> "I think it will make a difference. Maybe the difference will be smaller than we expected. I don't know. I mean, but the important thing is that there is a difference."

D(vi) Ethical Validity

As with catalytic validity, it was felt that there had been significant ethical validity throughout the course of the project, with the greater majority of participants feeling they have been treated fairly. Significantly, the answers suggested that the project had been ethically run and developed by the museum professionals coordinating the groups. Furthermore, there also seemed to be a strong ontological correlation between the participatory, intersubjective, empathetic and ethical validities.

For instance, numerous participants stated they felt the project had been balanced with their voices being heard during sessions. Elsewhere, it was felt that the participants had been treated equally and the groups sessions felt like a safe place to voice concerns or whatever was needed to express themselves confidently.

For example, one participant felt that ARCHES respected the participants, their differences and tried to integrate everyone in a collaborative way. He also felt that the tools and technologies developed during the course of the sessions would be enriched by inputs from participants with very different perspectives. Another participant from the same group stated:

> "Of course. Absolutely … If not, I wouldn't be here [laughter] on one hand, of course, but I mean it's obvious. It's obvious ... It's obvious because of their purpose of the project and it's obvious because of the people working and involved in the project."

Participants from another group felt that the project had been a chance to be honest about their feelings of inequality and allowed them to socialize equally. There was also a general feeling that everyone was listened to at some point, and even when people were skeptical or cynical about the implementation of the project, they were allowed to express this feeling openly.

However, despite these positive comments and although no one stated that the project had been unethical, there was a belief that the power some participants held could challenge a sense of fairness. In particular, there was a concern by some that a few participants were being listened to more than others, and those who spoke more were being listened to inequitably. It was also felt that some participants who were shyer found it difficult to get their voice across, given the confidence of others. As one participant stated:

> "Well, as in all groups there are people who voice their concerns more loudly than others. I think several people have already, not in a bad way, but [others] have been sitting back a bit more ... Yeah, that's part of the game so to say."

D(vii) Empathic Validity

As previously stated, during the interviews perhaps one of the strongest elements of participation was the development of a sense of empathy during the course of group sessions. Even when staff members or those with access preferences were critical of certain aspects of the project or felt frustrated about their technologies, they all seemed to have at least a sense of empathy for the access preferences of others.

For example, one participant described a situation where a fellow participant with what they described as "a strong intellectual disability" found it initially stressful to attend or be heard during sessions. This problem was particularly acute as this participant had joined in the middle of the project, which they felt made it harder for him to bond with other members of the group of feel accepted by others.

However, after different members of the group worked with this participant over a period of time and gave him increasingly more responsibility, they noticed the participant grew in confidence. Eventually, this participant found themselves putting their opinions across and was even given the opportunity to make public presentations.

> "This guy, this person was so closed, so shy, so introspective the very first day. And, last week when we did the intermediary middle term presentation of the project, he made a presentation on top of the stage and he was brilliant. And, now you see him interacting with the rest of the group, putting his opinion on top of the table, making his arguments, discussing, so it's brilliant."

However, there was not only empathy for different access preferences, but also for the responsibility and roles of museum professionals and technology developers. In particular, it was observed that discussing each other's roles and experiences during group sessions had helped each participant understand the nature of museum work. It also appeared to provide an insight to the difficulties of engaging with the museum as a disabled person.

Another theme raised on numerous occasions was the necessity of longevity as a catalyst for generating empathy amongst the participants. For example, following uneasy experiences in the early sessions between museum professionals and those who were recruited for their access preferences, it was felt that different participants now understood each other's needs more clearly. In this way, even tensions made it more likely to develop a sense of resilience amongst participants of all types given the passage of time.

> "I think I know what blind people need. But of course, now without all the other disabilities, so yes, this increased empathy in our case. But yeah, for the whole project I think just working together should increase this in any case, and I think this part worked quite well in ARCHES. Working two years together simply has to increase it."

Other participants felt that working on many of the tasks had helped participants gain a sense of empathy of others' access preferences and the general needs of others. Although this was not a focus of the tests, and was not considered in the original test designs, there was a belief that empathy occurred "organically," as a process of education.

For example, one participant stated that the use of technologies developed during ARCHES had enabled them to understand technologies could not simply be labelled as accessible by a single impairment category. Moreover, during the course of the project the participant said they had realized that technologies cannot be labelled as inclusive simply by being designed with the intention of providing access:

> "Oh yeah, I've learned a lot. I've learned that access is many things. And yeah, I've learned that it is very much down to the individual and cannot be labelled as easily. I mean we've had this conversation when we started, we never, I never wanted to put people into, all blind people are the same. But it did, yeah those conversations have helped a lot."

However, the development of empathy was occasionally tempered by a feeling that having empathy for another participant's access preferences could not help fully understand the whole of the person's needs – or what it was like to actually have another access preference. For example, one participant felt that although ARCHES tests and exercises had provided a theoretical understanding of other participants, he was not confident that his abilities to work with all the members of his group had improved in a practical way.

> "OK yeah, in a theoretical way, yes, but he is not sure if he could help a blind person or a person that can't hear so well if he really has to, yeah."

E. ANALYSIS OF THE TENSIONS THAT AROSE

As stated earlier in this report, the model of the While of Participation observes that tensions occurring during participation provide rich data and that these tensions can inform inclusive practice and more effective, democratic technological design. During analysis of this tensions-data it was also found that several tensions went beyond the original evaluation's validities and allowed the participants to develop a better understanding of unique participatory practices that could inform future as well as current practices. Consequently, this section examines the most powerful tensions that occurred during participatory practice and analyses their underlying causes during the work at hand. Following this discussion, this section examines how a number of these tensions were addressed during ARCHES and presents recommendations for future studies.

E(i) Tensions Caused During Participatory Practice

The most significant manifestation of tensions was often related to the roles that each participant had or perceived they had during the project. However, within this broader issue, the ambiguity of the "role of the participant," issues of power caused by these roles and the under-lying tensions that under-pinned the formation, practice and delivery of the results were found to be the primary causes of tension during ARCHES. Subsequently, during the early period of the project, two participant roles and sub-roles emerged, with these roles causing their own significant interlacing tensions. The main two roles in the project were: the partner participant and the volunteer participant.

The partner participants were, by their nature "professional participants" and their roles related to the skills and knowledge they brought with them to the project, the individual funding they received and the work-packages they were responsible for. The sub-roles of the partner participants were the individual professions that each person had during the project, and each sub-role could be broken roughly into three categories: technological professional, museum professional and academic professional. These sub-roles often brought their own communication and professional issues. For instance, as one partner stated of the early development of the project:

> "There have been problems in ARCHES I think, I believe that and probably it has been a problem not just of the companies, for everyone. We haven't explained ourselves probably well, the universities and the museums maybe we needed to talk more with the companies and explain how we work. Also then we kept inviting them to the groups and they never

came, that was important to understand how we work ... Probably the technological companies have a way to work that's not participatory at all, so it doesn't help. Usually we don't have a participatory way of working either so we handled that ourselves."

By contrast, the volunteer participants were either those that had been invited to be members of the group or had a voluntary role in supporting, advocating for or guiding members of the participatory groups within the museums. In some circumstances, volunteers were also the carers of volunteer participants within the groups – including parents or other family members – although this latter sub-role did not cause considerable tensions during the project.

However, there were observable tensions between those volunteer participants who brought their own previous skills and knowledge to the group, either as an advocate for disability rights groups or through a prior professional or voluntary advisory role, and those who had not had these roles previously. Thus, in the voluntary group two further significant sub-groups emerged: the novice volunteer, who had not participated in such projects before, and the experienced volunteer, who had.

E(ii) Analysis of the Tensions

The most significant tensions generated within the project were between those who had different roles within the participatory groups and the broader project – e.g. between the partner and volunteer participants, and between the sub-roles within each participatory group.

For example, it was observed that some volunteer participants often became dependent on individual professional participants in the group (Hayhoe, Garcia Carrizosa, Rix, et. al. 2018). In a number of the observational notes generated during the groups, for instance, it was also recorded that some volunteer participants chose to sit next to selected professional participants. These professional participants were then asked to scribe or read for them, and a form of dependency on this relationship thus developed. Such relationships could be long-running, with participants asking for partner participants in future sessions by name.

Although such dependency relationships did not appear to prevent participation by volunteer participants, there were occasional complaints of favouritism by other volunteer participants. Furthermore, there was a perception by some volunteer participants of undue emphasis being placed on the voice of these "favoured" participants. Such tensions led to the questioning of the power imbalance with the group of volunteer participants, who were perceived to be close to the partner participants and the rest of the group.

Similar power imbalances were also perceived within the partner participant group during the development of the technologies, with the economic culture of the technology companies and the lack of power of the museums being cited as a complicating factor in this process.

For example, Participant A felt tensions were caused by each partner thinking of themselves as an agent for their institution or class of institution – i.e. the technology company agent or the museum agent. Thus, as the project largely existed within museums, it was felt that the separate internal motivations of each partner necessarily complicated the evolution of the development of inclusive technological practices.

This agency, Partner A asserted, seemed to be largely motivated by traditional practices that agents brought with them, and their understanding of the aims of ARCHES as they aligned with their own individual aims. This led Participant A to feel that these agencies' expectations (or baggage) caused friction when each agent was seen to impose these expectations on developing synergistic relationships within the running of the project. As he stated:

"This economic outcome is complicating too much the relationship … with the technology companies. More even than the relationship that the museum and the university has, because, and this is really frustrating for us to see that we become as clients, but not clients in a way that we can decide, as clients, you know free clients and in a free market. But like when you receive funding and you are obliged to work with someone."

A further contributory factor of this power imbalance between partners was felt to be caused by a lack of experience, knowledge and expertise in certain key areas of the project's outputs. For instance, it was observed that some museum professionals would not think of themselves as researchers and thus able to contribute as much to the technological development of the project as academics or technology professionals did. In particular, Participant B quoted below felt that their main role was to provide feedback to the technology companies about topics

such as usability or technical problems. This perception, Participant B stated, was reinforced by the wording of the research contract and its assignment of specific roles during the project, an issue that was designed to provide responsibility for each element of the work package:

> "Interviewer: You don't see yourself as part of the research or as a [researcher] yourself? Respondent: To an extent yes, in maybe the feedback that I gave or with some of the things which concerned the technology and apps and games but nothing like [the university researchers]. I think I was more of a facilitator than anything else and I think that was kind of what the contract was. When you read through the contract it does say that museums are more there just to facilitate the sessions and to make sure that everything runs smoothly and okay and that we're there for the groups. But research, when I'm asked to do something, I will do it but I'm not a researcher."

Within the museum's participatory groups, there were also technical tensions brought on by the institutions themselves, with all ARCHES partners having to function within strict curatorial and management practices and policies. For instance, these policies led museum partners to feel they were being pulled between their roles as advocates and facilitators of participation yet at the same time having to work within curatorial practices and policies. Thus, some partner museums found it difficult to implement the planned innovations of technology, information and practice that technology companies often required.

For example, one of the cornerstones of access for people with learning access needs is the use of Easy Read texts – i.e. the use of simple grammatical structures and vocabulary in short vignettes of knowledge. Although the participatory groups and professionals were enthusiastic about the use of such texts throughout the museum, some museum participants found it difficult to convince their curatorial staff that this text should be available in all circumstances. As Participant C stated:

> "I still don't think our curators, for example, are convinced yet that all text labels should be in easy read. I think they'd be happy about having easy read labels available but not in a universal design principle."

Consequently, one of the causes of this perception of power imbalance between the museum partners and the technology and academic partners was the role of the institutions in drafting the original proposal and subsequent contract. In particular, the project became an exercise that was perceived to be driven by technological development rather than museum-based inclusion or access supported by new and emerging technologies. In addition, it was also felt that many of the research decisions were taken at the beginning of the research, particularly by the London group, and that these decisions and strategies were then imposed on the continental museums.

For instance, one participant stated that the communication rules that were developed in London and then transferred to the other museums took little account of the cultural differences of these partner groups or the need for rules of communication in each group. For some museum partners, it was even felt to be insulting that their participatory groups could be adjudged to need lessons in discussion and empathy for their diverse and often skilled participants. As Participant D stated:

> "I think that in this negotiation the university and technological companies were the ones to decide [the] objectives and not the museums, or not at least all the museums who were inside the project. Us intervening in the second phase of the project, it prevented us from having more impact and I think honestly maybe now I am throwing flowers to myself. The pilot group in London has done something that was not relevant for us apart from the practical issues and they were telling us things like you should make the communication rules. We work with groups, there is no way a group is going to work between each other if they don't have communication rules."

E(iii) Addressing the Tensions Within the Group

Overall, there was no single strategy that could address all the tensions that arose. This was largely because the same tensions could have different contexts in different participatory groups and different national and professional cultures. Furthermore, some tensions, such as partners having to function within strict curatorial and management practices and policies, were unresolvable during ARCHES, as they largely existed beyond the project's boundaries. Therefore,

there also needed to be a pragmatic approach to evaluating and reacting to what could be achieved within the time provided.

However, over the course of the project the participants reflected on these tensions, discussed them openly in partner meetings and participatory groups and fed back through emails and social media. Furthermore, the experience of working in different cultures and with different professionals that several partner participants brought with them to the project helped to reduce or at least mitigate tensions caused by differing points of view. For instance, Participant D, who prior to ARCHES worked in various roles and lived in numerous jurisdictions stated:

> "Well I guess [that] in the general meetings it's very often that, it's kind of conversation. Many things that are not even easy to grasp or to describe but I've worked in the three [countries], I've lived in the cultural ambiance, so I more or less know how people tick and what you need. And I very often, even also the [Partner E, Country A], I very often had to take them aside … I guess [Country A] people and the museums, so corporates and the [City A] museums especially sometimes had some communication problems or something like this. And so, I took the guy aside, and took him to another room and offered my help to solve the problem."

It also helped that the project took place over a relatively long period, as many of the tensions faced took time to resolve. This information sharing and the chance to experiment with solutions over the course of ARCHES allowed good practice to emerge and a common approach to tensions to evolve. Having three years to work on the project also gave participants the freedom to reflect and evolve on their roles within the group, and as a result tensions and their related issues became less frequent by the end of the project. Consequently, almost every aspect of ARCHES became less complex, more open to differing roles, interlinking paces of development and levels of participation, and as a result the participants often grew less timid. As Participant E stated:

> "I think it's quite complex, there are different layers around accessibility and around the technology and around the group dynamics. I've actually found that the credibility of it, the meaningfulness of it has increased, and in particular in terms of I think there's been a growing focus and a growing success in really handing over the dynamic to the group much more. I think the group were quite passive 18 months [ago] in relation to where we are now and as someone who was sitting and watching and dipping in and out of different conversations with different people, I just get this sense of a coherence and for me … I think personally the whole way in which you have such a different range of access needs for a group to gel as a group, I think has really moved on and that for me has been the key point of credibility."

Eventually, three underlying themes emerged that helped to relieve the most stubborn, addressable tensions. These themes were: 1) reflexivity, the ability of the project to reflect on tensions as they arose and the flexibility to develop common strategies that could overcome them; 2) learning, the ability of the project to learn about new situations and concepts as they arose, and more importantly the ability and willingness to learn about other professionals, access needs and national cultures during practice; 3) communication, the ability of the project to develop and continually use lines of communication, to discuss tensions and to address issues in a broad network.

For example, Participant F found that learning about inclusive technology and "buying into" the inclusive technology philosophy that underpinned ARCHES helped him better understand what the participatory groups wanted. Subsequently, from this learning experience, he found he could adapt the technology that he was responsible for developing and take a different view on access needs. As he stated:

> "I think for me personally it opened a little more even the horizon of what is an inclusive technology versus an adaptive technology. And where it's inclusive, more inclusive led the best option, or where is it better to adapt to specific needs of specific people, and why can that also mean inclusion."

Therefore, it is recommended that at least three more validities based on the underlying themes that helped to resolve tensions should be considered in the development, planning, practice and evaluation of future projects. These validities are:

- Reflexive Validity - Whether participants can respond to lessons learnt from the project, either on a personal level or to develop their own projects. This validity also asks participants to

consider whether there has been professional development that allows them to develop their own career paths.

- Learning Validity – Whether the project has significant scope as a learning project, and allows participants to learn new skills and knowledge during participatory practice. This validity should not only allow participants to learn about eachother's professions and skills, but also how their participation can develop future research, their careers, their role as an expert and the sustainability of participatory research.
- Communication Validity – Whether the project develops a web of communication and allows participants to communicate with each other on an equal level no matter where their location, educational level or ability to articulate themselves. This validity should also address power-tensions within the participatory groups and partner meetings, and act in-concert with the learning validity to make participants feel that they are equally valued.

F. CONCLUSIONS

For over a century, museums have attempted to develop models of inclusion for disabled people. However, many of these projects have been siloed – i.e. they often assumed visitors have what are presumed to be single access preferences, such as a visual need or a hearing need.

Furthermore, museums previously developed access and inclusion without the support or consultation of people with impairments. Thus, such initiatives have often only been able to take access and inclusion to what can be considered to a first stage of access inclusion.

Based as it is on a philosophy of emancipation, participatory research and practice has thus provoked a step-change in access and inclusion. Importantly, by consulting and involving disabled people in their own inclusion, and by enabling participants to dictate their own sense of inclusion, inclusion has become increasingly genuine. This has not only led to more practical and effective cultural access, it has also acted as a catalyst for further social and cultural action, and the development of skills that enable self-advocacy.

The ARCHES project started with the intention of developing participant groups in the museums of three countries. This was the first time this had been attempted, and the groups have now functioned consistently for two years or more. During this time, the participants challenged each other: they challenged technological development, they questioned research methodologies and museum practices and importantly they challenged their own perceptions of each other.

Through its work, ARCHES has now used participatory research and practice to develop models of participation based on participatory spaces, ethical practices developed by participants themselves, a model of cross-cultural participation and a model of inclusive capital. These models are not only practical tools for museums and technology companies, they are also research instruments providing a method of evaluating future participation and access, and drawing a road map for policy making.

Furthermore, ARCHES has broken previous boundaries of participation, by joining museum professionals and technologists with people with a range of access preferences to develop more inclusive technologies. Perhaps equally important, ARCHES has shown that participation can cross national borders and contribute to a greater European understanding of inclusion and access.

It is certainly true that this participatory practice and the experiences of working together has led to tensions, and many of these tensions have been outlined in the evaluation above and in previous deliverables. However, although these tensions have disrupted the groups they also served to improve them and served as lessons for participants to develop a sense of resilience, communication and reflective learning in their practice. Importantly, because of the longevity of the project these tensions increased empathy for all the participants based on their roles as supporters, designers or consumers of access.

However, although this project has made a new step forward in the development and understanding of inclusion, what is needed now more than ever is the legacy of this project to remain in museum partners. Equally important is a need for ARCHES to act as a catalyst for further projects, for funding structures and most importantly for local, national and pan-European policies. Without this further step forward, the developments we have worked towards will not achieve their full promise.

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H2020 - EUROPEAN PROJECT Date: 15/12/2019

POLICYBRIEF

for EC internal use

Project title: Accessible Resources for Cultural Heritage EcoSystems (ARCHES)

I. INTRODUCTION

Succinctly describe the relevant policy problem and relate your evidence to the task of addressing it.
(Note: It should not be an academic abstract or a summary of the project).

Comments: The policy problem addressed by ARCHES comes from COM (2018) 267 final, A New European Agenda for Culture[1] (**The New Agenda**). ARCHES has addressed the following problems from this agenda:

- "Foster the cultural capability of all Europeans by making available a wide range of cultural activities and providing opportunities to participate actively

- Encourage the mobility of professionals in the cultural and creative sectors and remove obstacles to their mobility

- Protect and promote Europe's cultural heritage as a shared resource, to raise awareness of our common history and values and reinforce a sense of common European identity" (P. 2)

In order to address these problems, ARCHES has developed:

- Evidence in this deliverable (D2.4) showing that participating museum and technology partners have developed a better understanding of what participatory design and inclusive technology is. This has led to a greater capacity for cultural participation in these museums and more refined inclusive technologies that are available to broader, marginalised pan-European user groups.
- Published work to enable greater participation and inclusion of people with access needs in European cultural activities, shared resources and cultural history, such as:
    - the development of a means of conducting and analysing participatory research that includes a range of access needs in a pan-European culture (including the while of participation[2]);
    - new models and theories of cultural inclusion and practical participation through cultural heritage practices and technologies (including the model of inclusive capital[3], the participatory

[1] European Commission. (2018). A New European Agenda for Culture - COM (2018) 267 final. Brussels: European Commission.

[2] Rix, J., Garcia Carrisoza, H., Seale, J., Sheehy, K., & Hayhoe, S. (2019). The while of participation: A systematic review of participatory research involving people with sensory impairments and/or intellectual impairments. Disability & Society. https://doi.org/10.1080/09687599.2019.1669431

[3] Hayhoe, S. (2019). Inclusive Capital & Human Value. In S. Hayhoe, Cultural Heritage, Ageing, Disability and Identity: Practice, and the development of inclusive capital., Abbingdon, UK: Routledge.; Hayhoe, S., Tonin, C. & Lunardi, G. (2017). A Model of Inclusive Capital for Analysis of Non-Economic Human Capital. Proceedings of Decent Work, Equity and Inclusion. Padova, Italy: University of Padova.

museum guide[4] and a proposal for a unified framework for the design of technologies for people with learning difficulties[5]).
- Policy recommendations, based on evidence from the evaluation featured in this deliverable and Key Performance Indicators (KPIs) for the design of inclusive technologies, featured in D6.5.
- A number of funded projects that have been informed by the technologies, models and theories developed during ARCHES.

Each of these elements is laid out in more detail in the sections below.

II. SOCIOECONOMIC AND DEMOCRATIC IMPACTS

Describe the so far observed potential economic, social and democratic impacts of your project and possible evidence of improved relationship between citizens and public administrations. To the extent possible, please provide figures or aggregated data.
(Note: Links to other policy areas should be taken into account and described, if applicable.)

Comments: ARCHES has created new impacts beyond the project in accordance with **The New Agenda**, through the following democratic and socioeconomic impacts:

- DEMOCRATIC IMPACTS: In accordance with the problem, "Foster the cultural capability of all Europeans by making available a wide range of cultural activities and providing opportunities to participate actively" ARCHES has developed the following impacts:
  - New access practices and the analysis of cultural heritage, cultural educational and research projects in countries beyond those involved in ARCHES through work carried out by the participating universities (see section III for specific examples).
  - Influences on international research studies and international publications that inform cultural inclusion beyond ARCHES[6].
  - New technological theories for making 2 $^{1}/_{2}$D instruments[7] and apps[8] accessible to users with access needs
  - New theories of educational methodologies[9] and demonstrations[10] for people with access needs.

[4] Garcia Carrizosa, H., Diaz, J., Krall, R., Faye, A., Skrbic, S. & Sisinni Ganly, F. (2019). Towards a participatory museum - A how-to-guide on inclusive activities. Vienna: ARCHES.
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[6] See for example, Hayhoe, S. (2019). Cultural Heritage, Ageing, Disability, and Identity: Practice, and the development of inclusive capital. (1 ed.) (Routledge Studies in Cultural Heritage). Abbingdon, Oxfordshire: Routledge. https://doi.org/10.4324/9781315149462; Hayhoe, S. (in press). Accessible Vacations (I): An insider guide to 12 US cities. New York: Rowman & Littlefield (Accessible Vacations); Hayhoe, S. (Accepted/In press). Using Qualitative Grounded Methodology in Educational Research: An introduction for emerging researchers. (1 ed.) Abingdon, Oxfordshire: Routledge (Routledge Series: Qualitative and Visual Methods in Education).
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SOCIOECONOMIC IMPACTS: In accordance with the problems, “Encourage the mobility of professionals in the cultural and creative sectors and remove obstacles to their mobility … [and] Protect and promote Europe's cultural heritage as a shared resource, to raise awareness of our common history and values and reinforce a sense of common European identity” ARCHES has made the following impacts:

- Sixteen participants went on to gain awards, training and jobs in the field of cultural heritage following their participation in ARCHES (see also section III for specific examples).
- A relief printer is currently undergoing patent applications.
- A shift in focus of technology partners and museum professionals to seeing all technology users and museum visitors as categories of people with access needs, thus broadening the market for their museums and technologies. This move has also been communicated through workshops throughout Europe run by ARCHES.
- SignTime have increased the visibility of sign language in public spaces and museums' awareness of the needs of people with hearing loss.
- Through publications, SignTime has engaged new industrial partners have become aware of us and have asked for cooperation.

III. USE CASES

Highlight concrete example(s) as a result of your project, implementing better public services and creating business opportunities with a focus on open government.

Comments: The following examples are concrete examples of impacts beyond ARCHES, that are a direct result of the participatory practice during the project:

- Model of participatory methodology – The model of participatory methodology has led to several broadcast and exhibited artworks and a manifesto of inclusion, which was itself developed by participants. The artworks included a tapestry exhibited at a conference at the Open University, a poem on a rare Bell at the Wallace Collection and videos produced in Madrid that were subsequently broadcast on the web. In addition, the participatory methodology was used in other funded studies, including two funded educational projects, FabLab Campana in Monterrey, Mexico[11], and a public education project in Bath that won an arts prize and went on to be featured at several local arts festival, the world’s first Digital Festival of Nature and Amsterdam’s Water Festival[12].
- Model of inclusive capital – The model that was developed during ARCHES, and has been used in four funded projects with international impact, including the River is the Venue (see above) and three research projects: a) funded research for the National Council for the Blind to inform its policy of support for Older Adults[13]; b) a study of ageing, disability and cultural heritage sites in the UK

Android platforms to image 'the body' and handwriting. In 2017 14th IEEE Annual Consumer Communications and Networking Conference, CCNC 2017 (pp. 622-623). [7983195] IEEE. https://doi.org/10.1109/CCNC.2017.7983195

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and US[14]; c) research on the exclusion of higher education students and staff with disabilities in the Gulf Cooperation Council (GCC)[15].

- Feedback from participatory practice during ARCHES has led to WiFi being installed at the Museo de Bellas Artes de Asturias, more accessible websites at the Kunsthistorisches Museum and Wallace Collection, and accessible sensory backpacks being developed at the Wallace Collection.
- As stated above, sixteen participants went on to gain awards, training and jobs in the field of cultural heritage following their participation in ARCHES. Examples of these include:
    - A participant from Vienna who won a traineeship for barrier free journalism at a daily newspaper and then a job at the Austrian Press Agency. He was subsequently elected the best junior journalist in the field of accessibility.
    - A participant from Madrid registered for a cultural course directed at people with learning difficulties after attending ARCHES sessions.
    - A previously unemployed participant from London started a voluntary post with her local museum after attending the ARCHES sessions – she cited her experience on ARCHES as her motivation for this post.
    - After experiencing sign-language during ARCHES, a participant from London has now registered for a sign language course in his local area.
- As stated above, VRVis has applied for a patent for a new form of relief printer.
- As a direct result of ARCHES, SignTime held a workshop with people with hearing loss and art educators in Austria. Consequently, the implementation of a separate project for this museum is now in the planning stage.
- After seeing their work on ARCHES, the SAMSUNG Group contacted SignTime and they are currently negotiating the integration of sign language modules in the TV sets of the next generation.
- Building on the work of ARCHES, SignTime is to present their work at the Zero Project Conference 2020, Vienna.
- SignTime has been nominated for a World Summit Award for the work it developed as part of ARCHES.
- SignTime is using the designs it developed during ARCHES for new commercial products, including: automatic translation of loudspeaker announcements in public transport; Automatic translation of weather forecasts and storm warnings; sign language dictionaries; translation of package leaflets for medicines.

IV. POLICY IMPLICATIONS AND RECOMMENDATIONS

State the policy implications of your intermediate findings, lessons learnt and, where possible so far, offer recommendations. Do you see any limitations of your findings, what knowledge gaps may still remain?

Comments: To summarise the findings made in the main body of this deliverable (D2.4) the following recommendations are made as a result of ARCHES:

- Recommendations for Access and Inclusion Policy in Cultural Institutions:
    - Inclusive Capital to Develop Human Value: During cultural visits, visitors should feel a sense of inclusion according to their own identity (e.g. disabled / non-disabled, ethnicity, nationality, etc.). In addition, inclusive practice needs to be ensured in five stages: bonding with people who make them feel comfortable; learning inclusively either through people they feel comfortable with or alone; accessing information that leads to inclusion and knowledge;

[14] Hayhoe, S. (2019). Cultural Heritage, Ageing, Disability, and Identity: Practice, and the development of inclusive capital. (1 ed.) (Routledge Studies in Cultural Heritage). Abbingdon, Oxfordshire: Routledge. https://doi.org/10.4324/9781315149462.
[15] Hayhoe, S. (2019). The Representation of Disability in the Higher Education Institutions of the Cooperation Council for the Arab States of the Gulf (GCC). Paper presented at Gulf Research Meeting, Cambridge, UK United Kingdom.

accessing public spaces and places, including cyberspace as well as a physical space; ensuring mobility and a means to navigate institutions (both physical institutions and cyberspace).

- Recommendations for Participatory Practice, Research and Evaluation
    - The While of Participation: Activities within participatory projects fall into seven broad categories (accessing information, capturing ideas, expressing ideas, analysing information, developing skills, building relationships and organising process). Considering these activities, the multiple interactions of participation will be happening while the activities are through them, within them and around them. Thus, participation and activity are inextricably linked and practice is therefore not about activity type but the manner in which all activity is undertaken.
- Practical Recommendations for Cross-Cultural Participation:
    - Museums need open and transparent communication from the beginning for collaboration
    - Museums must understand no one is an "expert," thus all voices need to be heard during participation
    - Museums must be flexible during exercises and practice is key
    - Museums must ensure there is a good representation of people with a wide range of access preferences at all stages of practice
    - Museums must identify what everyone brings to the project
    - Museums must be aware of the limitations of their inclusion project
    - Museums must understand there will be different rhythms of participants and partners
    - Museums must be flexible with needs to be shown to these rhythms
    - Museums must engage from the beginning with the recruitment process
    - Museums must be prepared to spread out communication strategies and start early with recruitment
    - Museums must give volunteers the chance to be part of the early planning stage
    - Museums must ensure gatekeepers may be supportive but won't guarantee participants
    - Museums should expect conversations about remuneration from volunteers
    - Museums must understand each visitor group is different, so models from other groups will need to be adapted
    - Museums must work with access preferences rather than impairment categories
    - Museums must take time to get to know each other in the early stages of the groups
    - Museums must expect requests for division of the groups according to impairment
    - Museums must ensure all materials are accessible and creative
    - Museums must develop strategies for working with mixed abilities
    - Museums must be aware of the power of relationships between participants
    - Museums must be alert to perceptions of favouritism and their creation and know the expectations and experiences of everyone involved
    - Museums must not overload the participants with information, and be prepared to take extra time for exercises
    - Museums must point out certain basic communication and operational conditions
    - Museums must produce multisensory and multifaceted approaches to artworks and technologies
    - Museums must establish communication rules within groups
    - Museums must think about each step of the process from the start, and break down each stage of each exercise before presenting it to the group
    - Museums must understand that findings change during the process of participation
- Ethical Recommendations for Cross-Cultural Participation in Museums:
    - Ethics should be negotiated with the participatory group itself, considering flexible consent and assent throughout the project via engagement and verbal, signs or symbols

- Initial consent should be provisional and continue to be gained throughout a project
- Groups should be encouraged to share information and be alert to collective pressures
- All materials should be made accessible to a range of access preferences
- Interventions and equipment should not carry potential dangers beyond those normally faced
- Staff and academics should ensure participatory practices are not harmful or threaten well-being
- Participants should be aware of breaches of confidentiality and trust
- Where appropriate, academics should have appropriate legal and security checks
- Participants should have the right to remove their footage or block its use

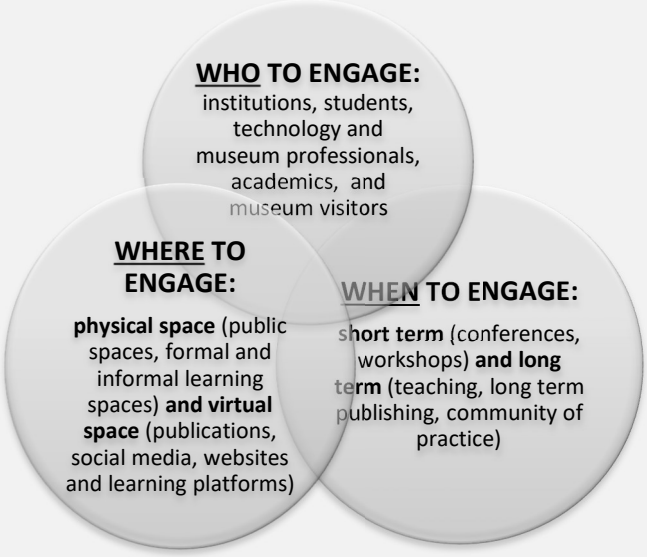
In addition to these recommendations, the following points need further discussion by the European Commission when commissioning future projects:

- There is a need to develop a common understanding of participatory research and design amongst technical companies and museums.
- In developing access and projects associated with access, institutions need to focus upon access needs and preferences rather than impairment categories.
- In deciding future funding related to participatory research, funders must be willing to risk emergent outcomes rather than requiring pre-determined outcomes at the point of agreeing funding.
- There should be a willingness to financially remunerate members of participatory research groups or to provide other culturally appropriate rewards as best suits the needs of those groups.
- In supporting the development of future participatory research, there is a need to ensure consideration has been given to the tensions, outcomes and component parts of participation.
- Accessibility must be increasingly perceived as an obligation by museums in mainstream projects. Otherwise, measures can only be financed through specialized grants and funded projects and it is difficult to develop a market for barrier-free products.

V. SUSTAINABILITY TOOLKIT

Describe the measures and actions that you have discussed so far in terms of exploitation and the economic model you discuss in order to insure the sustainability after the end of the project.

Comments: In order to develop a legacy for ARCHES, the project partners are engaging in short-term and long-term strategies based on three components of engagement: who to engage, where to engage and when to engage. This engagement can be summarised through the diagram below:



For example, in terms of its long-term legacy the results of ARCHES have thus far been published as social media posts, video and text via the official ARCHES website, a handbook and various peer-reviewed publications in virtual space – the latter are also available as physical documents. In terms of its short-term engagement, ARCHES' participants have conducted workshops for museum professionals and a final event in museums, and participants have presented and demonstrated the work of ARCHES through conferences in universities, museums, governments and NGOs. The audience for all these activities has included academics, university students, policy makers, museum and technology professionals and end users. This activity can be summarised through the diagram below: